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# THE HAWAIIAN PLANTERS' RECORD



Albert Koebel, a pioneer in the biological control of insects, photographed in a Honolulu garden about 1900. He was the first entomologist to introduce beneficial insects into Hawaii, many of which have been and continue to be of great value to the Territory. His work commenced in 1895 and was carried on for many years. His extensive collection of useful lady-beetles has finally been put in order by P. H. Timberlake, who treats with part of this collection in the present issue.

FIRST QUARTER 1943

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# THE HAWAIIAN PLANTERS' RECORD

Vol. XLVII

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*A quarterly paper devoted to the sugar interests of Hawaii and issued by the Experiment Station for circulation among the plantations of the Hawaiian Sugar Planters' Association.*

## The Coccinellidae or Ladybeetles of the Koebele Collection—Part I

AVAILABLE  
FOR REVIEWING

By P. H. TIMBERLAKE

During his career in Hawaii engaged in introducing beneficial insects, Albert Koebele accumulated a considerable collection of Coccinellidae, or ladybeetles, from many parts of the world, particularly California, Mexico, Australia, China, and Japan. After his death, the widow of Mr. Koebele presented this large collection of many thousand specimens to W. M. Giffard who, in turn, on October 12, 1927, assigned the collection to the Experiment Station, H.S.P.A. Much of the material was unnamed and as its value for reference depended on its being properly classified, named, and arranged, it was desirable that this should be done. Fortunately it was possible to arrange with P. H. Timberlake to undertake this task while on sabbatical leave from the Citrus Experiment Station, Riverside, California in 1930-31. He was particularly qualified for this task, having worked considerably with Coccinellidae while on the staff of the Experiment Station, H.S.P.A., prior to 1924. It proved to be too much of an undertaking for the time available. However, a large portion was completed, and it seems that it is desirable to publish it as Part I, leaving the remainder, when finished, for some future publication.

The present paper is published as a memorial in recognition of the valuable services of Mr. Koebele in the biological control of many of the troublesome insect pests in Hawaii.

It seems fitting to reprint here the accounts of Mr. Koebele's work in Hawaii, as given by Dr. R. C. L. Perkins and O. H. Swezey, on pages 359-368 of The Hawaiian Planters' Record, Vol. XXIX, 1925.

OTTO H. SWEZEY.

## THE EARLY WORK OF ALBERT KOEBELE IN HAWAII

By R. C. L. PERKINS

It was in 1890 that Koebele sent *Novius cardinalis* to Honolulu from California, where he had previously established it. Its success in controlling the cottony cushion scale, then one of the worst insect pests in the United States, had come to the notice of Mr. Jaeger, of Honolulu, who was interested in agriculture and horticulture, and it was through his sagacity that specimens were obtained from Koebele and introduced into Hawaii. As every one who pays any attention to such matters is aware, at this time, and previously, the above-mentioned pest was fully as destructive in the Islands as in California (where, of course, the interests were much greater) and some other "blights," as these insect pests were frequently termed, were almost equally destructive.

Thus we read that coffee, which had been introduced in 1825, by the middle of the century had become quite an industry on Kauai, but this was abandoned in 1856 owing to the ravages of "blight" said to have been introduced in 1850.

In 1876, the Rev. T. Blackburn, an expert entomologist in Honolulu, wrote that "the fruit trees were afflicted with an incurable blight."

The success of the *Novius*, which soon became manifest, led to Koebele's subsequent engagement partly by the Hawaiian Sugar Planters' Association and partly by the Government, as was urged by Mr. Jaeger.

Early in 1892, the writer became acquainted with Mr. Jaeger, who was naturally very enthusiastic, not only about what had already been achieved, but as to what further success Koebele might attain. He was very much surprised when informed that the latter's work as an entomologist was little, if at all, known except in the United States.

In 1894, many Coccinellidae were introduced by Koebele, chief among which were *Cryptolaemus montrouzieri* and *Coelophora inaequalis*. In the earlier literature the latter is unfortunately always referred to as "*Coccinella repanda*," the name used by Koebele, and it was not till many years afterwards that we received named specimens of the true *repanda* from Australia and became aware of this error.

Probably either of these two ladybirds was even more valuable to the Islands than the *Novius*, owing to the fact that they preyed on pests which seriously attacked a larger number of plants than did the cottony cushion scale.

In 1892, throughout the Kona district, where I was then stationed, *Pulvinaria* covered many of the trees, which were in a dying condition and many, in fact, were dead. After the *Cryptolaemus* was taken there, this scale to a large extent disappeared. There may be some who still remember the strange appearance of the trunks of many of the larger ornamental trees in Honolulu in June, 1896, when the *Cryptolaemus* larvae, having become full-grown, congregated together so as to form large white patches covering several square feet of the surface, which was entirely hidden by them. Owing to the white covering of the larvae many people mistook these for scale insects and were actually destroying them. Photographs were taken of some of these tree trunks and copies are probably still extant in the possession of the Territorial Board of Agriculture and Forestry.

In June, 1895, many of the native trees in the kipukas that are found in the forest at various parts within eight or ten miles of the crater of Kilauea were covered with a conspicuous black Aphid and others less noticeable. Many of the *Pelea* trees, especially, were in a dead or dying condition, but other forest trees were affected. At this time single specimens of *Coelophora* were rarely noticed, having evidently just arrived at the locality. In September, the ladybirds were in thousands and when the same places were revisited in August, 1896, we were unable to find even a single specimen of the large black Aphid.

Other ladybirds introduced at this early period were *Rhizobius ventralis*, *Platynomus lividigaster* and *Orcus chalybeus*, all of which were more or less successful and useful. Others were fully established at large, but later became either scarce or totally extinct. The history of some of these is interesting. No species appeared more promising for a time than *Chilocorus circumdatus*. At first the larvae became extraordinarily numerous, entirely clearing some trees

of the harder scales, but gradually the beetle became rarer and rarer, till after 1900 I myself saw only a few single individuals. *Novius koebeli*, so far as we are aware, disappeared still earlier, and so far as we know *Synonyche grandis*, by far the largest of introduced ladybirds, was common for only a very short time on some of the ornamental bamboos in Honolulu. *Leis conformis*, from which much was expected, was almost entirely a failure. The pretty *Coccinella pupillata* was noticed from time to time, but not in great numbers.

During the earlier years of his work, Koebele's visits to Honolulu were short and few, his material being liberated by the Commissioner of Agriculture, Joseph Marsden. Whatever may have been the latter's knowledge of agriculture, of entomology he had none beyond that of a few Latin names, to repeat which gave him a good deal of pleasure. No doubt Koebele's chief success with ladybirds as compared with other insects was due to this fact, for when liberated, full instructions having been given as to the place where they were to be turned out, they could look after themselves. But many small parasites were also sent, and of almost none of these is there any record, except *Chalcis obscurata*, which became very abundant throughout the Islands. As Koebele informed me, his special request that all the dead material should be saved for subsequent identification, was not attended to in any instance.

Owing to my own occupation in the forests of the different Islands and to Koebele's infrequent visits to Honolulu, we did not happen to meet during the earliest years of his work, but on returning from a considerable stay in the Kauai forests in 1895, I found him in Honolulu. Among other matters, we discussed the possibility of his economic introductions proving antagonistic to my own work on the native fauna, especially as some of the rarer species of native Hemerobiids, which had been unusually numerous on the *Aphis*-infested *Pelea* trees at Kilauea, had disappeared after the introduced *Coelophora* had eaten up the *Aphis*. Reference was made to this point in a brief account of Koebele's work which I wrote in 1896 and which was published in the following year in *Nature*. Imperfect as this account was, it at least had the effect of calling the attention of most European countries to his work and its possibilities.

As it was necessary for me, after I had met him, to do further work in East Maui, I persuaded Koebele to accompany me and share my tent, since he was anxious to obtain some knowledge of the forest insects, concerning which there were complaints. After spending some weeks in the high, wet forest of the windward side, we left our tent, and carrying as few *impedimenta* as possible, we worked about the summit and through the crater to the lee side, sleeping in the open or in such natural shelters as were available. Being lightly clothed we were a good deal troubled by the sharp frosts at night, which appeared abnormally cold after the fine hot weather of the daytime. I have referred to this, the first of several hard trips we made together, as it gave me the first opportunity to see what a very accomplished field worker Koebele had become. He was particularly expert at collecting difficult beetles, and had no doubt learned many wrinkles from his friend E. A. Schwarz, of Washington, in earlier years.

In 1897, I joined Koebele in California and accompanied him to Arizona and Mexico, where he hoped to obtain some natural enemy for the mealybug of the alligator pear. This had now become an unsightly pest, having been introduced since the earlier years of my collecting. The complaints about Lantana were already numerous and some preliminary investigation was made of the plant in Mexico, but at this time no attempt was made to introduce any of the insects attacking it.

In 1898 and 1899, I was in England working at the *Fauna Hawaiiensis*, but on my return (early in 1900) to the Islands I was still more in contact with Koebele than previously, since we not only made many collecting trips in company, but I did much study work in his office.

In 1900, the presence of a number of insects entirely unknown to me in 1897 was obvious. Chief among these was the melon fly (*Dacus cucurbitae*) and the cane leafhopper. The latter was noted first as a leafhopper new to the Islands, at Waialua, where it occurred in some numbers around the electric lights in 1900. Its connection with sugar cane was not known at the time; in fact not until a year or two afterwards, when it was reported by August Ahrens as injuring the cane on Oahu Plantation. There is no doubt that as a pest it first showed up on that plantation and it was probably introduced, or at least became established there first, about the year 1897. Had this insect occurred in earlier years, it is unlikely (considering its attraction by light) that I should not have noticed it, and quite impossible that Koebele, who was perfectly well acquainted with the accounts of the Javanese *vastatrix*, and was frequently in the cane fields investigating the cane borer and other cane insects, should have overlooked

it. In fact when he first saw the leafhopper in the Islands he took it to be the same as the pest recorded from Java.

Also in 1900, the fern weevil (*Syagrius*) was first noticed in fernhouses in Honolulu on maiden-hair ferns only, and the possibility of its spreading to the native tree ferns of the forest was not thought of.

The introduction of the melon fly must have taken place at about the same time. Up to the time when I left the Islands in 1897 melons were almost a drug on the market, and except possibly for the Chinese, could hardly have paid for raising. After my return, one of the first settlers in the agricultural colony at Wahiawa informed me that he considered the presence of the melon fly by no means a calamity, as he was able to raise melons by adopting certain precautions and obtain a good price for them, whereas formerly it would not pay to grow them. The species was first described in 1899 from specimens obtained by Mr. Compere in Honolulu. Koebele had, however, previously collected the species on one of his trips to the Orient, before it was known in the Islands, and had noted it as a pest on plants of the melon family. In 1900, I found Hawaiian melons and cucumbers were almost unprocurable. It does not appear that Koebele made any concentrated effort to obtain parasites for *Dacus*, possibly because Compere was specially investigating fruit flies at the time. In Mexico, when engaged on Lantana work, he noted a fine parasite on other fruit flies, but he would not take the risk of attempting to send over puparia of these flies, for fear that by some accident the flies themselves might be introduced. He was always cautious in his introductions and many of the Australian ladybirds he was afraid to send in their larval state for fear of introducing their parasites.

In addition to the one species, *Chalcis obscurata*, above mentioned, Koebele sent over many other parasitic Hymenoptera from various countries, Australia, America and the Orient, at a time when he was the only economic entomologist connected with the Islands. Many of these were parasites of scale insects and *Aleyrodes*, but *Ichneumonidae* were sent from America and *Braconidae* from Oriental countries.

No record exists of the minute scale parasites which were frequently sent. For instance, it is quite uncertain whether some of the established parasites on scales were the results of his sendings or whether they came by other means, but it is hardly probable that of the large number of species sent none survived, even though they had no expert handling on arrival. As Koebele was well acquainted with the exact localities of the scale insects in various grounds and gardens in Honolulu and gave exact directions, as to where the parasites were to be liberated, a certain amount of success probably resulted. Although he never cared to make any attempt to introduce birds, various species of frogs, toads and bats were sent, but the latter at any rate failed to become established, though individuals were seen alive for a year after their introduction.

Of his later work on the Lantana plant, the sugar cane leafhopper and some other less important insect pests, fuller published records exist and can be consulted.\*

Koebele was *par excellence* a field worker in entomology and his knowledge of living insects was of a most extensive character, as at one time or another he paid special attention to all orders, but chiefly to Coleoptera and Lepidoptera, to some of the minute Hymenoptera and to scale insects. At one period he did much rearing of micro-Lepidoptera for Professor Riley. As may be judged from the nature of his field work, the Coccinellidae or ladybirds were his especial favorites, and he collected great numbers of species in the various countries he visited. He was not a great reader of entomological literature, but certain systematic works he used continually, e.g., Maskell's and Green's Coccidae, and especially Crotch's book on the Coccinellidae, which accompanied him on all his travels. Of the classification and specific character structures of these groups he had an extensive knowledge, though he published no notes of a systematic nature on others excepting some official reports and even these were to him an uncongenial task.

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\* The Introduction into Hawaii of Insects that Attack Lantana by R. C. L. Perkins and O. H. Swezey. Entomological Series Bull. No. 16, Experiment Station, H.S.P.A., 1924.

Biological Control of the Sugar Cane Leafhopper in Hawaii by O. H. Swezey. Entomological Series Bull. No. 21, Experiment Station, H.S.P.A., 1936.

His success in the field was due to his acute perception of the habits of insects, and unsurpassed perseverance, and he was naturally a very quick worker, so that with insects that are rare and difficult to obtain he could collect a greater number in a given time than most of the best field workers we have known. Under any circumstances he was a most pleasant companion on a trip, for even when the hardest and most uncomfortable conditions were added to ill success he remained cheerful and good humored, hoping to the last to achieve something by which a failure might be converted into a triumph. He met with many adventures in his varied traveling, and in unhealthy countries contracted many fevers, which failed to lessen his enthusiasm for his work, but he rarely spoke of his adventures. In his younger days, when collecting in Florida, he was down with severe fever and has told us how, at the time, numbers of a fine Sphingid moth, the caterpillars of which he had laboriously collected, were emerging in numbers in the room in which he lay, and how he spent the night alternately in killing the specimens, lest they should damage themselves, and in lying in a fainting condition on the floor. As would naturally be expected, he was the discoverer of great numbers of species of insects which were new to science, and many were named after him by their describers.

#### BIOGRAPHICAL SKETCH OF THE WORK OF ALBERT KOEBELE IN HAWAII

By O. H. SWEZENY

Mr. Albert Koebele was the pioneer economic entomologist in the Hawaiian Islands. He was one of the first, if not the very first, entomologist to engage in the introduction of their natural enemies as a method of combating insect pests. His early work in this line was in California, where he introduced from Australia in 1888-89, the lady beetle *Novius cardinalis* Muls. as an enemy to the cottony cushion scale, *Icerya purchasi* Mask., a serious citrus pest. This was a remarkable success, and was considered to have saved the citrus industry from ruin.

At this time, Koebele was in the employ of the U. S. Department of Agriculture, an appointment which commenced in 1881-82. It was in 1885 that he was transferred to the Pacific Coast region, where he established his home at Alameda, California. During the several years that he was working in California he was chiefly engaged in the introduction of beneficial insects. Two trips were made to Australia for this purpose. This period of work ended on September 30, 1893, when he resigned from the U. S. Department of Agriculture to take up similar work in Hawaii, at first under a Commissioner of Agriculture of the provisional government, later as entomologist of the Board of Agriculture and Forestry, after the latter was organized, and about 1903 or 1904 was placed on the staff of the Experiment Station, H.S.P.A., as consulting entomologist, which position he held at the beginning of the Great War.

It has been impossible to obtain exact records of the work and travels of Mr. Koebele during his early work in Hawaii. However, during 1894-95, he made an extensive tour of Australia, Ceylon, China and Japan in search of beneficial insects desirable of introduction. Many lady beetles were introduced at this time. Among those which have become established and continue effective up to the present are *Cryptolaemus montrouzieri* Muls., *Rhizobius ventralis* Erich. from Australia preying on mealybugs; *Orcus chalybaeus* (Boisd.), *Serangium maculigerum* Blkb. from Australia, *Chilocorus circumdatus* Schon. from China, *Sticholotis punctatus* Crotch from China, all on diaspine scale insects; *Coelophora inaequalis* (Fab.), *Platyomus lividigaster* Muls., *Diomus notescens* (Blkb.) from Australia and *Coelophora pupillata* (Schon.) from Hongkong, all preying on plant lice. Among parasites that were introduced on this trip are *Chalcis obscurata* Walker and *Microbracon omiodivorum* (Terry), both from Japan and parasitic on leafroller caterpillars, the *Microbracon* being especially effective on the sugar cane leafroller.

In 1896-97 considerable time was spent in Mexico, Arizona and California, from which places large quantities of lady beetles were sent, also many kinds of cutworm enemies, but apparently these mostly failed to become established.

In 1899-1900, Koebele went on another trip to Australia, spending some time in Fiji on

the way, and also going to Hongkong on the return voyage. Many shipments of beneficial insects were made on this trip, particularly from Australia.

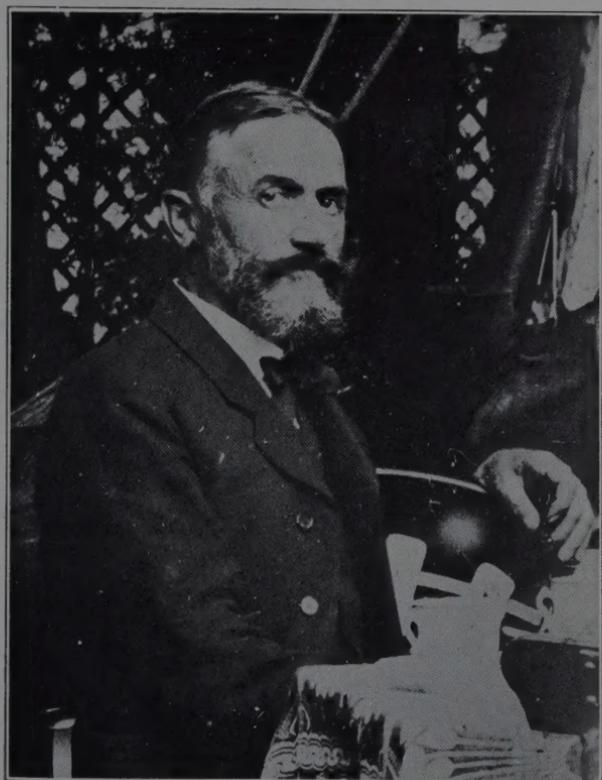
During the greater part of 1902, Koebele was studying the insects affecting lantana in Mexico, and sending to Honolulu those which he found to be particularly attached to lantana and not likely to become injurious to any other plants. At that time, Dr. R. C. L. Perkins was employed by the Territory and assisted Koebele in his work. The parasite material sent by Koebele was taken care of by Perkins and liberations made in favorable places for them to become established, at the same time destroying parasites, many of which affected most of the insects which it was desired to introduce. The enemies to lantana which were successfully introduced were as follows: Two butterflies, *Thecla echion* Linn. and *Thecla agra* Hew., whose larvae feed on lantana flowers; two moths, *Crocidosema lantanae* Busck, and *Platyptilia pusillidactyla* Walker, whose larvae destroy the lantana flower clusters; a leaf-miner, *Cremastobombycia lantanella* Busck, whose larvae feed inside the leaves; a leaf-bug, *Teleonemia lantanae* Dist., the young of which feed so numerously on the under side of the leaves as to destroy them and check the new growth of the plant sufficiently as to prevent flowering; a stem gall-fly, *Eutreta xanthochaeta* Ald., whose larvae live in enlargements of the freshly growing stems; a seed-fly, *Agromyza lantanae* Frogg., whose larvae feed in the fruits, often destroying the seeds, and usually causing the fruits to dry up, so that they are not eaten by birds with the resultant scattering of seeds. The combined results of the work of these eight introduced insects is to greatly reduce the enormous production of seeds that formerly occurred on lantana and which were so widely dispersed by the ripened fruits being eaten by birds.

During the summer of 1903, Koebele investigated leafhopper parasites in Ohio, where the writer had published a note on a dryinid parasite of a leafhopper occurring in grass lands of that region. He sent many hundreds of these parasites, and other leafhopper parasites that he discovered, to Hawaii to be tried on the sugar cane leafhopper which at that time was becoming very destructive on many of the sugar plantations. All of these Ohio parasites failed, and in the early summer of 1904, with Perkins, Koebele went to Australia in search of leafhopper enemies. Many were discovered in Queensland and attempts made at their introduction. The only successful introductions were four egg-parasites, the most important of which was *Paranagrus optabilis* Perkins, the second in importance being *Ootetrastichus beatus* Perkins, which was secured in Fiji, where Koebele stopped a short time on the return from this trip. The work of these egg-parasites resulted in greatly checking the leafhopper pest so that it was no longer a menace to the sugar industry. Another introduction at this time was *Aphanomerus pusillus* Perk., an egg-parasite on the torpedo-bug *Siphanta acuta* Walker, which was a pest on coffee, citrus and other garden and ornamental trees.

When he returned from Fiji, a short time was spent in Honolulu in the summer of 1905, which was the last time Koebele was in Honolulu. He went to California shortly afterward, and at different times in 1906-8 attention was given to the study of sugar cane insects and their parasites in Mexico and to the enemies of hornfly in Mexico and Arizona. A number of minor introductions were made. Those that succeeded were: *Eucoila impatiens* Say from Arizona in 1906, a parasite on dipterous larvae in cow dung; *Azya luteipes* Muls. from Mexico in 1908, a lady beetle feeding on Lecanium scales; *Hyperaspis jocosa* (Muls.), from Mexico in 1908, a lady beetle feeding on *Orthezia insignis* Douglas.

The latter part of 1908, Koebele went to Waldkirch, Germany, his boyhood home, where he was born in 1852. This was mainly as an opportunity for the recovery of his health which had been greatly impaired by so much time spent in entomological exploration and research work in fever-infested regions of the tropics. While there during the summers of 1909-11, he studied the enemies of hornfly, and sent much material to Honolulu, but little, if any, success was obtained by this. In 1910, on account of continued failing health, he was relieved from active duty, though still retained as Consulting Entomologist by the H.S.P.A. He continued living in Germany and was there during the Great War, on account of which he was reduced to very meager circumstances and both he and his wife suffered great hardships. At the close of the war, as soon as it was learned of their circumstances, attempts were made by the Hawaiian Sugar Planters' Association to arrange for their return to their home in Alameda, California. By the time that all arrangements were completed, however, he had become too feeble for undertaking such a trip. He continued to fail and his death finally occurred December 28, 1924, in his 73rd year.

The services rendered by Mr. Koebele and the benefits derived by the agricultural and horticultural interests of Hawaii by his introduction of beneficial insects cannot be estimated in dollars and cents. He made the beginning in this line of work, and much of the time was



ALBERT KOEBELE

Enlargement from a family group taken at his former home in Germany.  
(Courtesy of W. M. Giffard.)

working alone, yet seventeen species of ladybeetles were successfully introduced by him and have become valuable factors in keeping reduced such pests as scale insects, mealybugs, plant lice and leaf-mites. At least six other ladybeetles were introduced and became established, but after a few years disappeared. The eight lantana insects were introduced by him, and about the same number of miscellaneous parasites of Diptera, Lepidoptera, etc. Following Koebele in this line of work, the other entomologists have introduced a larger number of beneficial insects and some of them have produced more valuable results, but this should not in any way lessen the credit to be given to him who was the pioneer in Hawaii in this important phase of entomological work.

Papers and reports by Koebele or concerning his Hawaiian work were published as follows:

Report of a trip to Australia to investigate the natural enemies of the fluted scale. U.S.D.A., Ent. Bul. 21, 1890.\*

- Studies of parasitic and predaceous insects in New Zealand, Australia and adjacent Islands.\*  
 U. S. Dept. of Agriculture, pp. 1-39, 1893.
- Professor Koebele and his work. Planters' Monthly, XV, p. 103, 1896.
- Report on insect pests. Planters' Monthly, XV, pp. 590-598, 1896.
- Report of the entomologist of the Hawaiian government. Planters' Monthly, XVI, pp. 65-85, 1897.
- Report of Professor Albert Koebele, entomologist of the Hawaiian government. Planters' Monthly, XVII, pp. 208-219, 258-269, 1898.
- Report of Professor Albert Koebele, entomologist. Report of the Com. of Agr. and Forestry for 1900, pp. 36-49, 1901. Also in Planters' Monthly, XX, pp. 299-309, 1901.
- Report of Professor Koebele on destruction of forest trees, Hawaii. Rept. of the Com. Agr. and Forestry, Hawaii, for 1900, pp. 50-60, 1901.
- Notes on insects affecting the Koa trees at Haiku forest on Maui. Rept. of the Com. Agr. and Forestry, Hawaii, for 1900, pp. 61-66, 1901.
- Report of Professor Koebele on Lantana scale. Rept. of the Com. Agr. and Forestry, Hawaii, for 1901-02, pp. 54-65, 1903.
- Report of Professor Albert Koebele. Third Report of the Board of Com. of Agr. and Forestry, Hawaii, for 1906, pp. 159-164, 1907.
- Insect investigations in Mexico. Fourth Rept. Board of Com. of Agr. and Forestry, Hawaii, pp. 89-97, 1908.
- Report on the enemies of *Lantana camara* in Mexico, and their introduction into the Hawaiian Islands. Ent. Bul. No. 16, Exp. Station, H.S.P.A., pp. 54-71, 1923.

#### PREFACE

The following paper is the first of a series of parts dealing with the Koebele collection of Coccinellidae, which it is hoped may be finally completed. The first part deals solely with the tribe Coccinellini, or subfamily Coccinellinae as I prefer to call it. The species found in the collection are listed in what is believed to be the most natural sequence, with descriptions of such varieties and species that appear to be new. The notes in brackets are copied verbatim from Mr. Koebele's field note books and will be found to add ecological data of great value in many cases. In the Appendix I have added tables and descriptions which could not be interpolated conveniently in the list.

It has been found advisable to introduce a considerable number of new genera, particularly in the forms allied to the old genera *Cyclonedaa* and *Coelophora*. It is with some misgivings that I propose these, for while they are strictly commensurate in value to those in use for the fauna of North America and Europe, there is some doubt that the fauna of the whole world will stand such fine division. Particularly is this true of the fauna of the tropics, both of the Old and the New World, where the species of Coccinellidae are more numerous than in temperate regions. It has been suspected by some workers that the genera of the tropics would be found to be much less stable, or with more annexent forms, than is true of those inhabiting the temperate regions, and this view is probably based more or less on fact. However, the genera here proposed are natural groups and distinct in the usual morphological as well as genital characters.

It is necessary to add that the new genera, that are founded on described and presumably correctly recognized species, are nevertheless based on my recognition

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\* This paper is concerned with Koebele's work before coming to Hawaii, but the knowledge gained thus was of great assistance when he began here, and deals with the same species as many of his early introductions to Hawaii.

of those species. This statement is made in view of Opinion 65 of the International Commission on Zoological Nomenclature, which seems to be interpreted by some authors as an excuse to accept all genotype designations at face value, even when it is known that certain species so designated are misdeterminations. It should be the aim of the taxonomist to apply names (both specific and generic) as close to the original usage as his knowledge permits. Any procedure which contravers this principle seems to me decidedly unscientific.

P. H. TIMBERLAKE.

Riverside, Calif.

March 21, 1938

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### COCCINELLINAE

#### NAEMIA MULSANT

**Naemia seriata** (Melsheimer)

New Jersey, 2 specimens; Texas, 1; Staten Island, New York (Ormande), 1; Alameda, California (Koebele), 1.

#### PARANAEMIA CASEY

**Paranaemia vittigera** (Mulsant)

Siskiyou County, California, July (Koebele, No. 3037), 2; Alameda, California (Koebele), 2; Arizona (Koebele, No. 2429), 1; Guadalupe, Federal District, Mexico, Nov. 1907 (Koebele), 2.

I can not agree with Casey in the separation of *P. similis* Casey, and hardly believe that it is worthy of varietal or subspecific rank.

#### COLEOMEGILLA TIMBERLAKE

The generic name *Coleomegilla* was first used by me in Proc. U. S. Nat. Mus. 56, p. 139, unfortunately without credit to Cockerell, from whom the name had been received. Although I tried to correct this error later, I think it is necessary to take the literature as it stands and credit the name to the first user.

Leng has sought to synonymize *Coleomegilla* with *Ceratomegilla* Crotch, but I have examined the type species of the latter genus and believe that it is much more closely related to *Hippodamia* and *Adonia* than to *Coleomegilla*.

**Coleomegilla maculata lengi** new subspecies (*fusculabris* Casey, Leng and other authors, but not Mulsant)

Rochester, New York, May 17, 1898, 4 (paratypes); Columbus, Ohio, Aug. 1903 (Koebele), 6 (holotype and paratypes).

This is the familiar *Coleomegilla* of eastern United States described and figured many times under the name of *maculata* or *fusculabris* and hence requires no further description. When Leng described his *floridana* he evidently neglected to check the original description of *fusculabris* (Mulsant) for otherwise he would have discovered that *floridana* is identical with *fusculabris* which was described from New Orleans.

The race *decepta* (Blatchley) described as a form of *maculata* is not that species at all but is a southern race of *Naemia seriata* (Melsheimer). I have seen it from Beaufort, South Carolina, several localities in Florida and from Cuba and Haiti. It should be cited as *Naemia seriata decepta* (Blatchley).

**Coleomegilla maculata strenua** (Casey)

Sonora, Mexico (Koebele, No. 1680), 3.

("1680. Four specimens mounted from Hermosillo, Mex., April 1897, found in bush infested with aphids.")\*

This is hardly distinct from the more northern and eastern *lengi* by the characters cited by Casey, although it does undoubtedly average a little larger in size. However, there is a slight difference in the male genitalia, hence I am disposed to recognize it as a subspecies.

**Coleomegilla maculata medialis** (Casey)

Cuauhtla, Morelos, Mexico, Nov. 21, 1907 (Koebele), 6.

This race of Central America and the more tropical parts of Mexico has the head more strongly punctured than in *strenua*, and the markings are somewhat different. It intergrades northward with *strenua* and I have seen annectent specimens from Rosario, Sinaloa; Tuxpan; and Paso del Norte, Chihuahua.

**ERIOPSIS MULSANT****Eriopsis opposita** (Guérin)

Chile, 1 specimen.

**ANISOSTICTA CHEVROLAT****Anisosticta 19-punctata** (Linnaeus)

Berlin, Germany (Weise), 1 male.

**Anisosticta bitriangularis** (Say)

Peekskill, New York, June 24, 1893 (Ormonde), 1.

**MACRONAEMIA CASEY****Macronaemia episcopalalis** (Kirby) (Plate I, Fig. 1)

Eldorado County, California, June, 1901 (Van Dyke), 1.

**ADONIA MULSANT****Adonia variegata** (Goeze)

Waldkirch, Baden, Germany (Koebele), 3.

**HIPPODAMIA CHEVROLAT****Hippodamia tibialis** (Say)

Columbus, Ohio (Koebele), 4; Kansas (T. B. Ashton), 2; Oregon (Koebele), 1.

**Hippodamia parenthesis** (Say)

Boston, Massachusetts, June 16, 1894 (Ormonde), 1; West Point, Nebraska, June, 1884, 1; Easton, Washington (Koebele), 1.

**Hippodamia lunatomaculata** (Motschulsky)

Oregon (Koebele, No. 11), 3.

**Hippodamia apicalis** (Casey)

Argus Mountains, California, May, 1891, on *Pinus monophylla* (Koebele), 1; Placer County, California (Koebele), 1, and 1 male without data.

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\* This and subsequent quotations are from Koebele's field note books.

**Hippodamia sinuata** Mulsant

San Francisco County, California (Horn), 1; Alameda, California (Koebele, No. 18), 3.

**Hippodamia sinuata spuria** Leconte

Oregon (Koebele, No. 12), 3; Alaska, 2.

**Hippodamia koebelei** Timberlake

*Hippodamia convergens*, var., Gorham, 1891, Biol. Centr. Amer. 7, p. 153, pl. 8, fig. 24 (at least in part).

Exactly resembling in size and coloration the immaculate variety of *Hippodamia convergens* and hitherto confused with it, but easily distinguished in the male sex by the dilated front and middle basitarsi. The female is hardly distinguishable except by the more or less uncertain character of having the pale border of the pronotum narrower and more even throughout.

[While this paper was awaiting publication, the description of *Hippodamia koebelci*, designated by Mr. Timberlake as a new species, was withdrawn and published in Proc. Ent. Soc. Washington, 44: 39, 1942. This was done as it was desired to use the name in other literature awaiting publication.—O. H. S.]

Mexico, May 22 and 27, 1922 (E. G. Smythe); 1 ♂ Mexico City (O. W. Barrett); 1 ♂ Oaxaca, Mexico (L. O. Howard); 1 ♂ Las Vegas, Mexico (Hoege); 1 ♀ Mt. Diabola, Puebla, Mexico, July 29, 1901 (R. H. Hay); 1 ♀ Durango, Durango, Mexico (F. C. Bishopp); and 1 ♂, 1 ♀ Mexico (Koebele, No. 1687).—(See note No. 1687, under *H. convergens*.)

Types in U. S. National Museum, Cat. No. 55902, except the last female recorded above which belongs to the Koebele collection.

**Hippodamia caseyi** Johnson

Placer County, California (Koebele No. 8), 15 specimens; Easton, Washington (Koebele No. 9), 4.

This is the species called *lecontei* in my paper on *Hippodamia* (Jour. New York Ent. Soc., 27, p. 168 and 169, 1919). However, the real *lecontei* was described from New Mexico and, as I now recognize it, it is a form very close to *H. glacialis* and possibly only a subspecies. It occurs evidently along the eastern slope of the Rocky Mountains. The present species occurs from the Rocky Mountains westward to the Pacific Coast. It was found in the Casey collection under this name and as a part of the specimens were received from Johnson, the name is probably authentically applied, but the types of *caseyi*, if any are existent, should be investigated.

**Hippodamia convergens** Guérin

Newark, New Jersey, Aug. 16, 1896 (Ormonde), 1; San Francisco, California (Koebele, No. 5 and 6), 2; Placer County, California (Koebele), 8; Alameda, California (Koebele), 2; Santa Cruz Mountains, California, 1; Siskiyou County, California (Koebele, No. 7), 3; Eldorado County, California (Koebele), 2; Arizona (Koebele, No. 2417), 2; El Paso, Texas (Koebele, No. 1651), 1; Sonora, Mexico (Koebele, No. 1651), 4; Morelos, Mexico (Koebele, No. 1651), 5; Vera Cruz, Mexico (Koebele), 1; Mexico (Koebele, No. 1687), 10.

("1651. One specimen, El Paso, Texas; one at Cuautla, Morelos, Mexico; California. More from Cuautla."

"1687. Common on pine and fir trees, base of Popocatepetl, Mexico, May 1897, and feeding upon aphis."

**Hippodamia 15-maculata** Mulsant

West Point, Nebraska, June, 1888 (Bruner), 1 female.

**Hippodamia moesta** Leconte

Oregon (Koebele No. 23), 1 female.

**Hippodamia moesta bowditchi** Johnson

Alaska, 1 female.

From study of other material I have concluded that *bowditchi* is a form of *moesta*.

**Hippodamia 5-signata uteana** Casey

Goldfield, Nevada, June 27, 1907 (apparently collected by Nunenmacher), 6; Placer County, California (Koebele), 1; Siskiyou County, California, August (Koebele), 1; Panamint Mountains, California, April, 1891 (Koebele, No. 10), 6.

**Hippodamia 5-signata ambigua** Leconte

San Francisco County, California (Koebele, No. 2, 3 and 4), 6.

San Francisco is the type locality of *punctulata* Leconte, and *ambigua* was described from California and Oregon without a more definite type locality being indicated. After a careful consideration of the original descriptions I conclude that *ambigua* and *punctulata* are probably too similar to be kept separated satisfactorily, although I have seen little or no material from the northern part of California where typical *ambigua* should be found, if anywhere, in a more constant condition. In fact, typical *ambigua* as I deduce it from description is intermediate between *obliqua* Casey and *punctulata* Leconte. Specimens from southern California commonly have the pronotum white only on the anterior angles, but the posterior angles may have a smaller white spot, a white dash may occur at the middle of the anterior margin and two small white spots may occur on the disk. Specimens from the vicinity of San Francisco Bay commonly have the additional adornments and the pronotum also may be white clear across the anterior margin. Such is the condition as described for *punctulata*. *Ambigua* is described as having the lateral and anterior margins and two small discal spots white, with the discal spots and white anterior margin sometimes absent. It thus becomes a mere matter of choice or expediency whether to merge *obliqua* with *ambigua*, or to preserve *obliqua* and merge *punctulata* with *ambigua*. It is perhaps better to follow customary usage, unless all three names could be preserved, which might be a happy solution of the dilemma.

**Hippodamia 5-signata obliqua** Casey

Oregon (Koebele, No. 1), 4.

**Hippodamia glacialis** (Fabricius)

Columbus, Ohio, Aug. 1903 (Koebele), 3; Gravesend, Long Island, New York, Aug. 22, 1896 (Ormonde), 1.

**Hippodamia extensa** Mulsant

Alameda County, California (Koebele), 3.

**SEMIADALIA CROTCH****Semiadalia notata** (Laicharting)

Waldkirch, Baden, Germany (Koebele), 8.

**COCCINELLA LINNAEUS****Coccinella 7-punctata** Linnaeus

Waldkirch, Baden, Germany (Koebele), 5.

**Coccinella 7-punctata bruckii** Mulsant

Japan (Koebele, No. 1218), 3.

("1218. At Yokohama, Japan, beginning of March 1895, two specimens hibernating amongst a bunch of liliaceous leaves. One on floor of hotel. May 25, 1895, common upon most any aphid in larva state; some of the mature insects already out. Later on, common upon the hop aphis and various others on low plants. Bred parasite of pupa marked No. 1218, a species of Tetrastichine.")

**Coccinella nivicola monticola** Mulsant

Boston, Massachusetts, June 29, 1898 (Ormonde), 1; Placer County, California (Koebele), 2. Also 1 female without data belonging to the variety or race *alutacea* Casey.

**Coccinella prolongata** Crotch

"Washington Territory," 1 female.

**Coccinella californica** Mannerheim

Sonoma County, California, October (Koebele), 1 female.

**Coccinella transversoguttata** Faldermann

Oregon (Koebele), 5; Placer County, California (Koebele), 1; Mexico (Koebele, No. 1686), 7; Guadalupe, D. F., Mexico, Nov. 1907 (Koebele), 1; Ecuador (Baron), 1. These are mostly of the form *nugatoria* Mulsant.

("1686. Seven specimens while beating, base of Popocatepetl, 10,000 ft., May 1897, on aphis on *Pinus*.)

**Coccinella 9-notata** Herbst

Arlington Heights, Massachusetts, July 21, 1896 (Ormonde), 2; Newark, New Jersey, Aug. 16, 1896 (Ormonde), 1; New York (T. B. Ashton), 1; Columbus, Ohio (Koebele), 4.

**Coccinella 9-notata degener** Casey

Siskiyou, California, July (Koebele), 1.

**Coccinella 5-punctata** Linnaeus

Waldkirch, Baden, Germany (Koebele), 4.

**Coccinella trifasciata** Linnaeus

Easton, Washington (Koebele), 2.

**Coccinella trifasciata eugenii** Mulsant

Siskiyou County, California (Koebele), 1.

**Coccinella trifasciata juliana** Mulsant

Alameda, California, November (Koebele), 1; Santa Cruz Mountains, California (Koebele), 1.

**Coccinella trifasciata subversa** Leconte

Oregon (Koebele), 2; Easton, Washington (Koebele), 1; Alaska 1.

**Coccinella hieroglyphica kirbyi** Crotch

*Coccinella tricuspis* Kirby, 1838 (not Thunberg, 1794).

Minnesota, Sept. 1896 (Wickham), 1 female.

Dobzhansky in his revision of the North American species of *Coccinella* states that the genitalia of *tricuspis* are completely like those of *hieroglyphica* Linnaeus. However, I have observed a slight difference in the few specimens that I have compared, but perhaps not enough of a difference to lead one to suppose that *kirbyi* is much more than a subspecies of *hieroglyphica*. The median lobe of the tegmen is a little shorter in *kirbyi* than in *hieroglyphica* and tapers gradually from the broadest part just before the base to a narrower and more acute apex. The ventral surface of the apical part is appreciably tectiform. In *hieroglyphica* this lobe is appreciably less triangular in outline, the sides being more arcuate and the apex blunter. The apex is also just appreciably curled upward and the ventral surface of the apical part is much more depressed than in *kirbyi*. The paramera in *kirbyi* are also slightly more expanded on the apical half.

**Coccinella hieroglyphica humboldtiensis** Nunenmacher

Siskiyou County, California (Koebele), 2 females. There is also 1 male with the same data in the U. S. National Museum.

The genitalia of *humboldtiensis* are exactly as in *kirbyi*.

**Coccinella novae-zelandiae** Colenso

New Zealand (Koebele), 6; Paramatta, New South Wales, June 2, 1904 (Koebele), 1 female.

This species of the southern hemisphere corresponds to the holarctic *C. 11-punctata* Linnaeus, and indeed is not very distinct therefrom. I have also seen one male that was collected by O. H. Swezey in Field 39, Oahu Sugar Company, Hawaii, June 1, 1923.

**Coccinella transversalis** Fabricius

*Coccinella transversalis* Fabricius, 1781.

*Coccinella repanda* Thunberg, 1781.\*

China (Koebele, No. 1337), 1; Formosa (Koebele, No. 1337), 1; Ceylon (Koebele, No. 1209), 2; Australia (Koebele, No. 17), 31; New South Wales (Koebele, No. 1158), 3; Gordon, New South Wales (Koebele), 1; New Caledonia (Koebele), 3; Fiji (Koebele), 1; and 12 specimens without data, probably from Australia.

("1337. One specimen saved, collected upon pine, Kowloon, Nov. 1895. Amoy, China, Dec. 9, 1895, and Swatow, hibernating. Kowloon, on various plants, not breeding, Dec. 13, 1895. Bred from larva found upon a liliaceous plant infested with aphids and *Dactylopius*, Oct. 11, 1895. At Tamsui, Formosa, beginning of Dec. 1895, one specimen. Many sent to Honolulu during above time."

"1209. One specimen brought to me from Aragam, Dec. 27, 1894. Very common amongst grass in larva, pupa and imago state. Some sent to Honolulu. Out of ten pupae collected but one of these produced the mature insect, and all others chalcid parasites which are mounted and bear this number. Parasite is *Syntomosphyrum* sp."

"1158.") See Koebele note under *Coclophora inaequalis*, var. 9-maculata (Fab.).

**Coccinella leonina** Fabricius

New Zealand (Koebele), 1 female.

\* *C. transversalis* has a few month's priority as claimed by Mulsant.

### COCCINELLINA NEW GENUS

The neotropical species (except *C. transversoguttata* Fald.) which have been referred to *Coccinella* are rather different from the familiar holarctic species, being mostly small, or rather small, more or less oval and less convex species. Structurally they are very similar to *Coccinella* but lack the oblique line of the metacoxal plate, the bounding line curving off very close to the hind margin of the segment. Mesosternum sometimes very slightly sinuate in front medially. Pronotum black with a narrow pale border on anterior and lateral margins and sometimes with two discal spots. The male genitalia of *Coccinellina* are in general similar to those of *Coccinella*, but the median lobe of the tegmen is not modified as in some species of *Coccinella* (e.i., *C. 9-notata* Herbst, *C. transversoguttata* Fald., etc.,) but agrees better with such species as *C. hieroglyphica* Linn. and *C. 11-punctata* Linn. On the dorsal surface of this lobe are two groups or two lines of fine hairs.

The following Central and South American species, all described under *Coccinella*, may be included at least provisionally under *Coccinellina*: *C. ancoralis* (Muls.), *C. areata* (Muls.), *C. emarginata* (Muls.), *C. eryngii* (Muls.), *C. fulvipennis* (Muls.), *C. lucasii* (Muls.), *C. petitii* (Muls.), *C. pulchella* (Muls.). Of these species *C. emarginata* (*Coccinella emarginata* Mulsant) may be taken as the genotype.

#### **Coccinellina emarginata** (Mulsant)

Mexico (Koebele, No. 1688), 2; Morelos, Mexico, October (Koebele, No. 1688), 2; Vera Cruz, Mexico (Koebele), 1.

I have seen examples of this species from many other localities in Mexico, also Nicaragua (Managua and San Marcos), Costa Rica (San Jose, Zarzero and Tilaran), Honduras (Tegucigalpa), Venezuela (Merida) and Ecuador (Méra and Baños).

("1688. A form that I cannot place, close to *C. sanguinea*. One specimen at Cuautla, Morelos, four on Popocatepetl, Mex., marked with this number.")

#### **Coccinellina lucasii** (Mulsant)

Chile (Pfordte), 2.

### ADALIA MULSANT

#### **Adalia bipunctata** (Linnaeus)

Waldkirch, Baden, Germany (Koebele), 1; Trigny, France, Aug. 1901 (Koebele), 2; New York, 2; Philadelphia, Pennsylvania, Oct. 1903 (Koebele), 2; Columbus, Ohio, Sept. 1903 (Koebele), 1.

#### **Adalia bipunctata**, var. *quadrimaculata* (Scopoli)

Waldkirch, Baden, Germany (Koebele), 2; Marin County, California (Koebele), 1; Hayward, Alameda County, California, on *Coccus hesperidum* Linn. (Koebele), 1; Alameda County, California (Koebele, No. 24), 1; Placer County, California (Koebele), 1; Siskiyou County, California (Koebele), 1; Davenport, Tulare County, California, 6400 feet, May, 1903, on willow (Fuchs), 4.

#### **Adalia frigida** (Schneider)

From the work of Miss Miriam A. Palmer in Colorado on the heredity of *Adalia* we may safely conclude that most if not all the endemic North American forms of this genus may be referred to the holarctic species *A. frigida* (Schneider). The forms are in no sense geographic races but rather genetic forms or color phases and more or less perfectly segregant in heredity.

The following forms are found in the Koebele collection:

**var. *parvula*** Weise

Massachusetts, 1; Michigan, 1.

**var. *melanopleura*** (Leconte)

Placer County, California (Koebele), 1; Easton, Washington (Koebele), 2.

**var. *immaculata*** Johnson

Oregon (Koebele, No. 20), 1; Alameda, California (Koebele, No. 21 and 501), 1.

**var. *annectans*** (Crotch)

Oregon (Koebele), 1; Siskiyou County, California, July and August (Koebele, No. 19), 2; Placer County, California (Koebele), 2; Eldorado County, California (Koebele), 1; Alameda, California (Koebele), 1; Argus Mountains, California, on *Pinus monophylla* May 1891 (Koebele, No. 20), 1.

**Adalia 10-punctata** (Linnaeus)

Waldkirch, Baden, Germany (Koebele), 5. These are mostly of the variety *10-pustulata* (Linnaeus).

**APHIDECTA WEISE**

**Aphidecta oblittera** (Linnaeus)

Waldkirch, Baden, Germany (Koebele), 8.

**TYTTHASPIS CROTCH**

**Tytthaspis 16-punctata** (Linnaeus)

Berlin, Germany (Weise), 1 male.

**SYNHAMONIA GANGLEBAUR**

**Synharmonia conglobata** (Linnaeus)

Yvours, France, July, 1901 (Koebele), 1 female.

**CISSELLA WEISE**

**Cissella furcifera** (Guérin) (Plate I, Fig. 2)

One specimen of this Australian species in wretched condition and without data, except the number 2595.

The claws are entirely missing, but one antenna is complete and ten-jointed by partial fusion of the normal last two joints. Joints 3 and 4 about as long as thick. Joints 5 and 6 subequal, somewhat longer than either 3 or 4, and about one and one-third times longer than wide. Joints 7 and 8 subequal as to length, each somewhat longer than either 5 or 6, 7 being hardly wider at apex than the preceding joints, but 8 distinctly so. Joint 9 somewhat longer than 8, widened toward apex, and about one and one-third times longer than wide. Joint 10 (10 and 11 fused) oblong, somewhat more than one and one-half times longer than wide, and slightly contracted at each end, with the apical margin very slightly oblique. On one surface the suture separating joints 10 and 11 may be distinguished, both joints being distinctly broader than long and 10 distinctly larger than 11. The markings are in close accord with Mulsant's description.

Crotch's recognition of a species of *Ucrania* as *furcifera* was of course not sound.

## COCCINULA DOBZHANSKY

**Coccinula 14-pustulata** (Linnaeus)

Bas-Alpes, France, 1901 (Koebele), 1.

## HARMONIA MULSANT

The type of *Harmonia* has never been cited definitely to my knowledge. Four species were originally included, and of these *Coccinella marginepunctata* Schaller (*C. 4-punctata* Pontoppidan) is here selected as the type. On this basis *Ptychanatis* Crotch, 1874 (type, *Coccinella axyridis* Pallas) and *Callineda* Crotch, 1871 (type, *Coccinella 16-notata* Fab., per Rye, 1873)\* fall as synonyms. Also most of the species included in *Leis* Mulsant, 1850 (type, *Coccinella dimidiata* Fab., per Crotch, 1874) and in *Stictoleis* Crotch, 1874 (orthotype, *Coccinella coryphaea* Guérin) must be assigned to *Harmonia*, although I have had no opportunity to investigate the genotypes. The genus is very widely distributed in Europe, Asia, Africa and Australia but does not occur in the New World.

### **Harmonia axyridis** (Pallas)

China (Koebele, No. 1312), 14; Hongkong, China (Koebele, No. 1312), 6; Formosa (Koebele, No. 1312), 1; Japan (Koebele, No. 1235), 56. Also 66 specimens without data, but presumably from China.

This large series shows the usual well known variation in markings.

("1235. Very numerous at Miyanoshita, Japan, April 6-8, 1895, upon various trees and sometimes in lots, yet hibernating. Also Atami a few days later, here already laying eggs with aphids on rose. A variable insect, many pinned. Quite common upon aphid on maple at Yokohama, April 20, 1895. Many sent to Honolulu.

"Became very numerous the end of May and beginning of June, when the second brood began to appear. Feeding upon any kind of aphid and *Lachnus*, a bluish aphid upon *Podocarpus*, *Kermaphis pini* on pine. Sept. 12, 1895, at Tumato, Japan, upon willow infested with aphid, large numbers of pupae were observed, and at Nikko on Sept. 19, 1895, upon walnut infested with a pale spiny aphid and a leaf-hopper (*Ledra?*), larvae of all sizes were still present and beetles [that were] collected oviposited many eggs."

"1312. Very abundant upon *Pinus sinensis*, at Hongkong, China, Oct. 21, 1895, and here feeding upon *Lachnus* infesting these trees. Eggs were numerous but since 1306 [*Sospita chinensis* Muls.] and 1307 [*Bothrocalvia alboleucata* Schônh.] were also numerous it cannot be stated to which they belonged. Bred from larvae on *Lachnus*. Also at Tamsui, Formosa, upon pine infested with *Lachnus*, Dec. 6, 1895.")

### **Harmonia conformis** (Boisduval)

Australia (Koebele, No. 3), 15; New South Wales (Koebele, No. 1003), 1; Bundaberg, Queensland (Koebele), 2.

("1003. Common all over S. Australia, Victoria, New South Wales and southern Queensland, chiefly feeding upon Aphidae, yet later in the season doing good work on the woolly aphid. Bred same parasite from this beetle as found in Europe

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\* Crotch in his Revision (1874) selected *Callineda decussata* Crotch as the type of *Callineda*. As this species is not congeneric with the type selected by Rye (Zool. Rec. 8, p. 329), I propose *Rhopaloneda*, n.n., for *Callineda* Crotch, 1874 (not Crotch, 1871).

and America. At Mt. Victoria, N. S. W., March 28, 1892, breeding upon *Eriococcus leptospermi* Mask.

"Observed eggs on orange infested with aphis at Honolulu, March, 1894, from specimens liberated on tree two weeks previous.")

#### **Harmonia antipodum** (White)

New Zealand (Koebele, No. 486), 4.

("486. Found these insects quite abundant, feeding on *Ctenochiton viridis* Maskell, near Auckland, N. Z. They were at the time, Feb. 23, 1889, in all stages from eggs to the mature insects.")

#### **Harmonia testudinaria** (Mulsant)

Australia (Koebele, No. 19), 5, two of these with the additional data: Toowoomba; Brisbane, Queensland (Koebele), 10; Bundaberg, Queensland (Koebele), 2.

("1019. At West Maitland, New South Wales, Nov. 5, 1891, upon peach trees infested with aphis, a few specimens only, one pair in copula. Also at Brisbane upon orange and *Ficus* sp., Nov. 12, 1891. At Toowoomba, Nov. 15, 1891, numerous upon nettle tree and myrtle. Upon these one very fresh and soft specimen found, yet no larvae observed. One larva upon aphis on orange at Parramatta.")

#### **Harmonia bicolor** (Blackburn)

Cairns, Queensland (Koebele), 2; Geraldton, Johnston River, Queensland (Koebele, No. 1183), 2.

("1183. With the foregoing [1182, *Microcaria jansoni* Crotch] at the same place and food [at Geraldton, Q., Aug. 10-15, 1894, upon *Hibiscus* tree, badly infested with a Psyllid], one specimen apparently different, marked 1183. One specimen at Kuranda, Aug. 21, 1894, upon young tree with *C. repanda*.")

#### **Harmonia 16-notata** (Fabricius)

China (Koebele, No. 1342), 2 females.

("1342. Two specimens at Kowloon, Nov. 18, 1895, upon *Psidium* infested with *Pulvinaria psidii*.)

#### **Harmonia arcuata** (Fabricius)

China (Koebele, No. 1341), 8; Fiji (Koebele), 8; Australia (Koebele, No. 53 and 1053), 5; Toowoomba, Queensland (Koebele, No. 53), 2; Cairns, Queensland (Koebele), 5.

("1053. At Broadwater, Richmond River, New South Wales, Jan. 10, 1892, upon a fern growing in swampy ground and infested with *Lecanium*, larvae, pupae and imagoes, in vial No. 53. April 6-15, 1892, at Toowoomba, Queensland, a number of specimens feeding upon aphis on young orange trees, variable. At Levuka, Fiji, breeding upon *Aleyrodes* upon taro leaves (*Colocasia* sp.), Jan. 19, 1892. At Cairns, Queensland, beginning of August 1894, on various plants, common near sea-shore upon a morning-glory, feeding upon Cicadinae.")

"1341. First specimen found upon a weed, second upon orange infested with *Lecanium*, *Pulvinaria*. More here and breeding upon *Hemerocallis* infested with *Pulvinaria*, *Dactylopius* and *Lecanium*, Kowloon, November 1895. Many specimens, Swatow, China, Dec. 11, 1895.")

**Harmonia 4-punctata** (Pontoppidan)

One female of this European species without data, belonging to the var. *16-punctata* (Fabricius).

**MULSANTINA WEISE**

*Mulsantina* was proposed by Weise (1906) as a new name for *Cleis* Mulsant, 1850, p. 162 and 208 (type *Cleis mirifica* Mulsant), not *Cleis* Mulsant, 1850, p. 130 and 135 (= *Clynis* Mulsant), nor *Cleis* Guérin, 1832. *Pseudocleis* Casey, 1908 (orthotype, *Coccinella picta* Randall) is a synonym.

**Mulsantina picta** (Randall)

Wisconsin (Wickham), 2; Placer County, California (Koebele), 2.

**Mulsantina picta minor** (Casey) (Plate I, Figs. 3, 4, 5)

Alameda, California (Koebele, No. 27 and 50), 6, one of these from a larva feeding on pine aphids at Hayward, issuing Dec. 1, 1893; Oregon (Koebele, No. 25), 2; Easton, Washington (Koebele, No. 26), 4; Mexico (Koebele, No. 501 and 1647), 18; Morelos, Mexico (Koebele), 1; Guadalupe, D. F., Mexico, Nov. 1907 (Koebele), 1.

("501. Dec. 25, 1889, at Alameda upon *Pinus insignis* blown over by wind and thickly infested with *Lecanium* sp., which were yet small, was found very abundant, a variable coccinellid. Also collected at Sisson upon pine, but at this locality no scales were observed, but large aphids were abundant. No larvae or pupae were found at this date, except old pupae, which were probably those of *Chilocorus bivulnerus* Muls., which insect was also present in large numbers.

"July 13, 1893, found upon orange infested with *L. oleae* and *L. hesperidum*, at Hayward, Alameda Co., Calif., not common.

"Very numerous in Oregon, during April-June, 1893, upon fir trees infested with a white coccid. Bred on *Crataegus* infested with *Lecanium* sp. and aphids, feeding on the latter.

"Bred from larvae feeding upon *L. oleae* at Hayward, Sept. 16, 1893. This specimen appears to differ—punctuation of elytra finer.

"Common at base of Popocatepetl, Mex., in many varieties, upon pine and fir trees infested with aphids.")

(For notes on one specimen confused under No. 1647, see following species.)

**Mulsantina mirifica** (Mulsant) (Plate I, Figs. 6, 7)

Mexico (Koebele, No. 1647), 6. Also two specimens from the same source in the U. S. National Museum.

("1647. Eight specimens of peculiar species, beating, at Oaxaca, Mexico, August 18-22, 1897.")

**Mulsantina mirifica, var. *lynx*** (Mulsant) (Plate I, Fig. 8)

Mexico (Koebele, No. 1649), 3. Also two more with same data in U. S. National Museum.

("1649. Four specimens collected, beating, at Oaxaca, Mex., August 17-22, 1897.")

This variety is a little smaller than *M. picta minor* (Casey) more broadly oval and with appreciably finer and sparser punctures on the elytra. The male genitalia of *lynx* are identical with those of *mirifica* and I agree with Crotch in making it only a variety.

Gorham's *Coccinella albopicta* is evidently the same as *mirifica*, as I can not detect anything in his description whereby to separate it. On page 168 of the "Biologia" Gorham remarks that a specimen determined by Crotch as *Cleis lynx* belongs to his *albopicta*.

#### **NEOHARMONIA CROTCH**

For the type of *Neoharmonia* Crotch, 1871, Rye (Zool. Rec. 8, p. 329, 1873), selected *Harmonia viridipennis* Mulsant among the twelve described species originally included. *Agrabia* Casey, 1899 (haplotype, *Harmonia cyanoptera* Mulsant) and *Neoharmonia* Casey, 1899 for which I hereby select *Coccinella venusta* Melshimer, as type, are synonyms.

##### **Neoharmonia cyanoptera (Mulsant)**

Douglas County, Arizona, Aug. 1904 (F. H. Snow), 1 female.

##### **Neoharmonia venusta (Melsheimer)**

Virginia (Beyer), 1 male.

#### **SOSPITA MULSANT**

##### **Sospita chinensis Mulsant**

Hongkong, China (Koebele, No. 1306), 3; and 115 specimens without data but presumably from Hongkong.

("1306. At Hongkong, China Oct. 29, 1895, upon *Pinus sinensis*, quite common a coccinellid, apparently found previously in Japan. Feeding upon *Lachnus*.)

#### **MYRRHA MULSANT**

##### **Myrrha 18-guttata (Linnaeus)**

Waldkirch, Baden, Germany (Koebele), 2 females.

#### **CALVIA MULSANT**

##### **Calvia 10-guttata (Linnaeus)**

Japan (Koebele, No. 1237), 3 females.

("1237. Few at Miyanoshita and more at Atami, April 1895, upon various trees and not upon any particular food. Some sent to Honolulu. At Yokohama in larva state upon alder infested with mildew.")

#### **ANISOCALVIA CROTCH**

##### **Anisocalvia 14-guttata (Linnaeus)**

Waldkirch, Baden, Germany (Koebele), 2 females; Japan (Koebele, No. 1237), 1 female. (See Koebele note under preceding species.)

The following varieties of *14-guttata* were recognized in the Koebele collection:

var. *scutulata* (Weise)

Oregon (Koebele, No. 15), 1 female.

var. *12-maculata* (Gebler)

Oregon (Koebele), 2 males.

var. *vancouveri* Casey

Oregon (Koebele, No. 16), 7.

### ANATIS MULSANT

#### **Anatis ocellata** (Linnaeus)

Waldkirch, Baden, Germany (Koebele), 7; Oregon (Koebele), 3.

The Oregon specimens are quite typical both in form and markings. The sutural pubescence at apex of elytra is well developed.

#### **Anatis ocellata halonis** Lewis

Japan (Koebele, No. 1262), 1 male.

("1262. One specimen upon oak infested with *Lachnus* at Gifu, Japan, May 2, 1895.")

#### **Anatis ocellata mali** (Say)

One male without data, but presumably from the eastern part of the United States.

*Mali* is quite distinct from *15-punctata*, but I believe it is only a race of the holarctic *ocellata*. It has the sutural pubescence of *ocellata* and the male genitalia are identical.

#### **Anatis 15-punctata** (Olivier)

Boston, Massachusetts, July 16, 1896 (Ormonde), 1 male; Providence, Rhode Island, May 21, 1898 (Ormonde), 1 male.

#### **Anatis rathvoni** (Leconte)

Alameda, California (Koebele), 1; Siskiyou County, California (Koebele), 3; Placer County, California (Koebele), 2; Easton, Washington (Koebele), 1; Oregon (Koebele), 1.

### NEOMYSIA CASEY

Contrary to Casey's opinion I find that North American species of *Mysia* Mulsant are quite congeneric with the European genotype, and in fact, so closely related that it would be better to consider them races of *oblongoguttata*. As *Mysia* is a preoccupied name, *Neomysia* Casey, 1899, will hold, and *Paramysia* Reitter, 1911, falls as a synonym.

#### **Neomysia oblongoguttata** (Linnaeus) (Plate I, Fig. 9)

Waldkirch, Baden, Germany (Koebele), 3 females; Oregon (Koebele), 1 male.

The Oregon specimen is certainly not separable from European material of *oblongoguttata*. I have compared the genitalia with those of several European males and find them practically identical. *N. hornii* (Crotch) was described from Oregon and the above specimen agrees so closely with the description that the conclusion is inescapable that *hornii* must fall as a synonym of *oblongoguttata*. *N. hornii* was described as being entirely testaceous red except that the sides of thorax are broadly whitish and the mesepimera white. The Koebele specimen has the elytra streaked with a paler color, just as is commonly seen in many European specimens, but I do not believe that this deviation from the condition found in type of *hornii* is of much importance.

#### **Neomysia oblongoguttata caseyi** new subspecies

Specimens from California commonly referred to *hornii* differ somewhat in coloration and slightly in the male genitalia. The pronotum lacks a well defined median dark area, but sometimes there is a nubilous and more or less broken darker M-shaped mark. Typically the prono-

tum and elytra are almost uniformly reddish. The elytra, however, may have three reddish vittae on a paler ground, of which the two inner ones are broader and unite near apex.

In the type series from Eldorado County, California, three have a more or less definite M-shaped mark on thorax and vittate elytra. Two are similar but have the two inner vittae more or less expanded and confluent so as to cover almost all of the area of the suture. The other five have the elytra nearly uniformly colored, although sometimes a little paler on outer margin. One of these, which is much paler in color than the others, has a feeble M-shaped mark on the thorax, while the other four (including holotype) have hardly any trace of it.

The median lobe of the tegmen (male aedeagus) as seen from above is narrow but distinctly less acicular than in *oblongoguttata*. It expands slightly from the middle to apical third, whence it tapers gradually to an acute point. In *oblongoguttata* it is uniformly narrow. As seen from the side this lobe is considerably less deep in *caseyi* than is *oblongoguttata*.

Described from ten specimens (holotype and paratypes) in the Koebele collection from Eldorado County, California.

#### **Neomysia oblongoguttata interrupta** Casey

Argus Mountains, Inyo County, California, on *Pinus monophylla*, May 1891 (Koebele, No. 17), 3.

The median lobe of the tegmen in this race is similar to that of *caseyi*, but is slightly narrower and attains its greatest width at distance of about one-fourth the length of lobe from apex instead of about one-third.

This race is widely distributed, occurring in Southern California, Arizona, New Mexico, Colorado, and Utah. In some localities in Arizona, New Mexico, and Colorado the inner vitta is more or less completely confluent at apex with the median vitta. This character used by Casey to separate *hornii* (not Crotch) from *interrupta* is therefore too fluctuating to be of much value. It may even be present in the race *caseyi* above described, but that shows a distinct tendency toward an immaculate condition of the elytra.

A further peculiarity of this reddish-vittate race not mentioned by Casey is the presence of an additional spot or streak intercalated between the bases of the median and subsutural vittae. This spot in the vittate specimens of *caseyi* is not very distinct and is confluent with the subsutural vitta.

Specimens from Hood River, Oregon (Hubbard and Schwarz), and Bear Paw Mountains, Montana (Hubbard and Schwarz), are not typical but perhaps are better referred to *interrupta* than elsewhere. They have vittate elytra, with the intercalated mark. Four out of twelve specimens from Bear Paw Mountains have black instead of reddish markings and resemble *randalli* Casey, but the male genitalia are similar to those of *interrupta*. In the true *randalli* from the Lake Superior region the genitalia have the median lobe of tegmen of uniform width as in *pullata*, but more slender, yet not so acicular as in *oblongoguttata*.

#### **Neomysia oblongoguttata subvittata** (Mulsant)

Placer County, California, June (Koebele), 5; Oregon (Koebele), 1; Easton, Washington (Koebele), 1.

This race differs from all the others in the broad form and ventricose elytra. It has been commonly identified as *subvittata* (Mulsant) although redescribed by Casey as *oregona*.

The elytra have more or less developed black or fuscous vittate markings. The dark median area of the pronotum is much narrower than in *pullata* and varies from red-brown to black. In the former case it may be uniformly colored or margined

laterally with black either partially or completely. Sometimes the dark area encloses two basal pale spots, thus vaguely indicating an M-shaped mark seen in other races. In one specimen the pronotum has two basal black spots, the remainder of the median dark area feebly indicated by a slightly darker color than the sides. The pale side areas are always much larger than in *pullata* and show no trace of an enclosed dark spot. The dark vittae of the elytra vary greatly, but are usually more or less incomplete or broken. The median vitta is sometimes considerably broadened and confluent at apex with the outer vitta. The subsutural vitta is always short and free.

In form and markings this is removed about as far as possible from typical *oblongoguttata* but it approaches it most closely of all the North American races in the form of the male aedeagus. I have examined the genitalia of three males and they all differ slightly. In one male from Placer County, California, the median lobe of the tegmen is virtually as in *oblongoguttata*, being if anything a little more elongate and acicular. In another male from the same locality, the median lobe is slightly widened between the middle and apical fourth where it begins to taper to the apex. In a third specimen, taken from sea-drift, Manzanita, Oregon (S. E. Keen) the median lobe is uniformly still wider from base up to a point near the apex where it begins to taper (virtually as in *pullata*). I am unable to say at present which of these is most representative of the race as a whole.

**Neomysia oblongoguttata pullata (Say)**

New York, 1 female.

**Neomysia gerstäckeri (Mulsant)**

Uruapan, Michoacan, Mexico, July, 1906 (Koebele), 1 female.

### CYCLONEDA CROTCH

The genus *Cycloneda* should be restricted to *sanguinea* and allies with immaculate elytra. The numerous neotropical species commonly referred here are much more closely allied to *Neda* than to *Cycloneda*.

Over twenty years ago I had opportunity to assemble living material of all three of the North American species of *Cycloneda* (*sanguinea*, *munda* and *polita*) and made numerous reciprocal crosses. Only newly emerged or virgin females were used in the experiments and whenever they were mated with males of the other two species they always remained sterile. There are only slight differences in the male genitalia of the three species, but these differences are apparently constant, and in view of the sterility between the species I believe that they are perfectly distinct.

**Cycloneda sanguinea (Linnaeus)**

Vera Cruz, Mexico (Koebele, No. 1641), 2; Morelos, Mexico (Koebele, No. 1641), 8; Orange, California (Koebele), 1.

("1641. Collected at Orizaba and Oaxaca, Mexico, where one specimen was bred from pupa found under pecan nut infested with *Lachnus*. Cuautla, Morelos, Mexico.")

**Cycloneda munda (Say)**

New York City, New York (Ormonde), 1; and 2 without data.

### **Cyclonededa polita** Casey

Oregon (Koebele, No. 23), 2; Easton, Washington (Koebele), 2; Siskiyou County, California (Koebele), 1.

### **Cyclonededa polita flava** new subspecies

Like typical *polita* but perhaps averaging a little smaller and more or less testaceous yellow instead of brilliant scarlet. It is thus much like the eastern *munda* but much smaller. The markings of the pronotum as in *polita* and *munda*, the differences cited by Casey between the two being rather inconstant.

Length, 3 to 4.25 mm.

Described from 6 specimens (holotype and paratypes) from Alameda, California (Koebele), and 3 specimens (paratypes) from Santa Cruz Mountains, California (Koebele, No. 22). All except one paratype from Alameda are in the Koebele collection. The one exception in collection of Citrus Experiment Station.

### **OLLA CASEY**

#### **Olla V-nigrum** (Mulsant)

*Coccinella abdominalis* Say, 1824 (not Thunberg, 1794).

*Harmonia V-nigrum* Mulsant, 1866.

*Cyclonededa sayi* Crotch, 1871, n.n. for *abdominalis* (Say).

Other early names, such as *binotata* (Say) and *oculata* (Fab.), that have been used sometimes for this species, or its dimorphic form, are apparently not applicable.

Santa Cruz Mountains, California (Koebele), 3; Eldorado, California (Koebele), 2; Arizona (Koebele, No. 2430), 1; Mexico (Koebele, No. 1652), 1; Morelos, Mexico (Koebele, No. 1652), 2; Sonora, Mexico (Koebele, No. 1652), 10; Honolulu, Oahu (Koebele), 1.

("1652. Three specimens, Cuautla, Morelos, Mexico, August 1897, all mounted. Base of Popocatepetl, Mex., May 1897, on pine infested with aphis, 10,000 feet. California and Hawaiian Islands, where it has been common for some twenty years.")

#### **Olla V-nigrum, var. *plagiata*** Casey

Santa Cruz Mountains, California (Koebele), 1; Los Angeles County, California, July (Koebele), 2; Tucson, Arizona (Kunze & Wickham), 2; Sonora, Mexico (Koebele, No. 1681), 1.

("1681. Two specimens feeding on *Aleyrodes*, Hermosillo, Sonora, Mex., April 1897.")

### **PARANEDA NEW GENUS**

This genus is proposed for some of the neotropical species hitherto referred to *Cycloneda*, especially *pallidula* (Mulsant). The type is *P. viridescens* n. sp. described below.

Frons less than twice as wide as diameter of eyes, with the inner orbits convergent above. (Wider in *Olla* and *Cyclonededa*, with inner orbits parallel.) Eyes rather coarsely faceted. Antennae strongly clavate, the club large, not elongate, with the last joint slightly longer than wide and obliquely truncate. Prosternal process bicarinate. Mesosternum moderately emarginate medially in front. Epipleura rather less than twice as wide as space between middle coxae, which are rather broadly separated. Epipleura slightly subfoveate to receive apex of hind femora. Metacoxal line curving outward just in front of the hind margin of the segment, the oblique line absent. Elytral punctures very fine. Form orbicular, very convex. Elytra unicolorous. Pronotum pale at the sides and darker medially, the two shades separated by a

more or less distinct black line which curves outward to the basal angles and then sometimes extends forward along the side margins for a short distance.

*Cycloneda rubida\** and *Paraneda pallidula* have been confused more or less and were considered by Gorham to be varieties of one species, but they are quite distinct, although it is rather difficult to discriminate them in every case. *Rubida* differs from *pallidula* in having the frons very narrow, no wider than diameter of the eyes, the latter a little more coarsely faceted; claws small, much shorter than in *pallidula*, or hardly longer than the basal quadrate tooth; mesosternum rather less emarginate in front medially; and the male genitalia decidedly different. *Rubida* is also more orbicular than *pallidula*. The color is deep red, varying at least after death to flavous. The darker color at the middle of the pronotum is not so broad as in *pallidula*, the line of demarkation more curvilinear, curving outward in front slightly as well as behind, but hardly reaching to the posterior angles and never continued forward as a dark line on the exterior margins. Of *rubida* I have seen the following material in the U. S. National Museum: 2 from Bugaba, Panama (Champion); 2 from Cayuga, Guatemala (Wm. Schaus); and 2 from Cacao Aguas, Alta Vera Paz, Guatemala (Schwarz and Barber).

*Pallidula* was described from Cayenne and Brazil, and *gutticollis* (Mulsant) from South America without a more definite locality. *Gutticollis* has the darker median area of the pronotum bordered with black. *Pallidula* as defined by Mulsant differs in lacking the black border, but it is likely that this is not a constant character and at any rate Crotch and other authors have recognized only one species. Crotch says that *pallidula* "varies a good deal in appearance, being in life a bright green, which pales to a dirty yellow." The Mulsantian descriptions, however, do not give much suggestion of a green color in life. It seems likely that Crotch as well as Gorham have confused two or more species under *pallidula*. Unfortunately I have not been able to see any South American material, but I am able to distinguish two species in material from Central America and Mexico. One of these is described below as *viridescens*. The other is more likely the true *pallidula*. It is represented by one male collected at Cacao Trece Aguas, Alta Vera Paz, Guatemala (Schwarz and Barber). It has the middle of the pronotum and the elytra flavous (without any hint that a green color may have existed in life) and the elytra are not blackened along the sutural margin. The genitalia of the Guatemala specimen differs very decidedly from that of *viridescens*. The aedeagus as a whole is much more elongate. Sipho not twisted at apex, the filament beyond the dorsal flaps much prolonged, nearly as long as the part on basal side of flaps, very slender and becoming exceedingly attenuate at apex. Paramera slender. Median lobe of tegmen about four times as long as wide, with subparallel sides, depressed, but with a slight tectiform swelling on dorsal surface at basal third, the apex deeply emarginate, with tooth on each side of the emargination acutely triangular and twice as long as wide at base.

#### ***Paraneda viridescens* n. sp. (Plate I, Fig. 10)**

Elytra light green, fading after death more or less to a pale testaceous color, or to various pale shades of yellowish, brownish or flavous. Sutural margin of elytra very narrowly blackened. Middle of pronotum dull brownish or reddish, the sides with a broadly oval pale yellowish or creamy area. Border of the darker area marked more or less distinctly with a

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\* In the Appendix this species is referred to a new genus (*Erythroneda*).

black line, which is curvilinear behind and meets the basal angle where it turns forward and follows the outer margin for a short distance. Anteriorly the black line becomes straighter and fails to attain the anterior margin by a brief interval. The head, under surface of body and the legs, more or less reddish brown, but the epipleura of prothorax and of elytra much paler and the mes- and metepimera are whitish. Length about 5.9 to 7 mm., width about 4.9 to 5.5 mm.

Aedeagus in *viridescens* much less elongate than in *pallidula*. Sipho not slender, not produced into a filament beyond the rather elongate membranous flap and strongly twisted near apex. Paramera distinctly widened toward the apex. Median lobe of tegmen about three times as long as wide, with parallel sides and a high teetiform ridge on the basal two-fifths of dorsal surface. Basal part of this lobe very thick dorso-ventrally which is not the case in *pallidula*. Apex of lobe with a broad rounded emargination, the tooth on each side of emargination obtuse and hardly longer than wide at its base.

Described from the following material: 6 specimens (holotype and paratypes), Eldorado, Sinaloa (S. E. Flanders), two paratypes in U. S. National Museum, the others including holotype, in collection of Citrus Experiment Station; Mazatlan, Sinaloa (Koebele), 1 paratype in U. S. National Museum; Colima, Colima (Conradt), 1 paratype in U. S. National Museum; Oaxaca (Koebele), 2 paratypes, one in Koebele collection, one in U. S. National Museum. These localities are all in Mexico.

The following material in the U. S. National Museum is probably referable to *viridescens* but the series I believe includes no males, so that the allocation is somewhat doubtful: 5 from Santiago de Maria, Salvador, on coffee (K. A. Salman); 2 from Tucurrique, Costa Rica (Schild & Burgdorff); and 2 from San Jose, Costa Rica (J. Fid Tristan).

#### NEDA MULSANT

##### *Neda marginalis* Mulsant

Mexico (Koebele, No. 1570), 3; Morelos, Mexico (Koebele, No. 1570), 8.

("1570. Found at Cuautla, State of Morelos, and preying upon a chrysomelid larva infesting a tropical deciduous tree, *Datura*. Specimens mounted and others sent to Washington to be tried upon North American chrysomelid larvae. Larvae of many sizes were found, yet no eggs. Collected July 1-3, 1897. A month previous those trees had no leaves.

"At Oaxaca, Aug. 17-22, pupae found quite numerous under Brazil and walnut trees (pecan-Castillian) infested with *Lachnus* sp., also larva observed amongst lice. A small dipterous larva issuing, numerous, from pupae. Issued end of September, a *Phora*."

#### EGLEIS MULSANT

The Australian species here associated are plainly congeneric, but should probably be segregated from *Egleis* proper, which is South American. I have not seen any of the American species of the genus and consequently I am not able to point out any distinguishing characters for the Australian group.

##### *Egleis kingi* (Macleay) (Plate I, Fig. 11)

Australia (Koebele), 2.

##### *Egleis delta* Weise (Plate I, Fig. 12)

Australia (Koebele, No. 57), 1; Brisbane, Queensland (Koebele), 1; Cairns, Queensland (Koebele), 1.

("1057. One specimen collected on road from Lismon to Brunswick, New South Wales, upon orange tree, on *aphis*.)")

**Egleis edwardsii** Mulsant (Plate I, Fig. 13)

Australia (Koebele, No. 31), 2; Brisbane, Queensland (Koebele), 1.

*Pascoei* Crotch is a synonym of *edwardsii*.

("1031. Three specimens, one of them newly hatched, upon orange at Parramatta, New South Wales, Nov. 23, 1891, no doubt feeding upon *aphis*. One specimen at same place, Dec. 25, 1891. Another at same place Sept. 27, 1894.")

**Egleis barronensis** (Blackburn) (Plate I, Fig. 14)

Australia (Koebele, No. 1161), 28; Cairns, Queensland (Koebele, No. 1161), 11.

("1161. Quite numerous upon orange and lemon trees at Kuranda, Queensland, and feeding on orange *aphis*. Also at Kamerunga and Geraldton, Johnston River.")

**ARCHAIONEDA CROTCH**

**Archaioneda tricolor fijiensis** Crotch

Fiji (Koebele), 12.

I have not been able to check the identity of this with typical *tricolor* (Fabricius).

**CLEOBORA MULSANT**

**Cleobora mellyi** Mulsant

Victoria (Koebele), 1; also one without data.

**VERANIA MULSANT**

**Verania flavovittata** Crotch (Plate I, Fig. 15)

Bundaberg, Queensland (Koebele and Perkins), 8.

In this species there are two broad black vittae on the disk of each elytron, uniting at the callus, the inner one oblique, joining or nearly touching the sutural vitta appreciably behind the middle. The other, usually but not always, wider than the inner one, extending straight back parallel with the margin and ending at the apical sixth, where it is rarely joined to the sutural vitta by an expansion of the latter.

I have seen it labeled incorrectly as "furcifera Guérin" in some collections.

**Verania frenata** (Erichson)

Australia (Koebele, No. 4 and 490), 6; Bundaberg, Queensland (Koebele, and Koebele & Perkins), 12; also 10 without data.

("490. Coccinellid on aphid resembling *Kermes* on pine, *Kermaphis pini* Koch.

"Found this insect abundant at Toowoomba, Queensland, Jan. 1, 1889, upon Acacia infested by a coccid resembling that infesting pine trees in Australia and New Zealand. No larvae were observed.")

**Verania lineola** (Fabricius)

Australia (Koebele, No. 54), 1; Sydney, New South Wales (Koebele, No. 54), 1; Brisbane, Queensland (Koebele), 1; Bundaberg, Queensland (Koebele), 1; Cairns, Queensland (Koebele), 6; Fiji (Koebele), 5.

("1054. Common everywhere from Clarence to Tweed River and very abundant at the latter place, in all stages, breeding upon *aphis* on maize. One of the larvae

had killed a nearly grown larva of *Heliothis armigera* while coming out of a corn cob.

"New Caledonia; Fiji. Parramatta, one. Brisbane. Sent to Honolulu.

"Everywhere around Cairns, Queensland, July 1904. Bred *Centistes americana* and parasite on larva as well. Found quite numerous at Hambleton and Mulgrave, Cairns, Queensland, July to September, 1904, on sugar cane. Badly parasitized in larva state by chalcid. Specimens sent to Honolulu. Also Bundaberg, Queensland, September to November 1904, also badly parasitized. Found on various plants and trees, not numerous. Always a few obtained for Honolulu.")

#### **Verania discolor** (Fabricius)

China (Koebele, No. 1330), 2; also 36 specimens without more definite data than the number; Hongkong, China (Koebele, No. 1330), 4; Anuradhapura, Ceylon (Horn?), 1.

("1330. Two specimens at Kowloon, Hongkong, Nov. 3, 1895, one on *Psidium* infested with aphids, second on *Celtis*, also on aphids. Numerous on *Psidium*, etc. infested with *Pulvinaria psidii*.

"Swatow, China, Dec. 11, 1895, hibernating in large numbers in screw palms, etc., a few specimens upon *Brassica nigra* (mustard) infested with aphids.")

#### **MICRASPIS** CHEVROLAT

##### **Micraspis striata** (Fabricius)

Camerun, 1.

##### **Micraspis cardoni** (Weise)

Ceylon (Koebele, No. 1213), 2.

Weise placed this in *Verania*, but the orbicular form and broad epipleura agree much better with *Micraspis* (*Alesia* authors).

("1213. One specimen at Kandy, Jan. 4, 1895, upon jack fruit tree (?), where larva was observed. Nenra Eliya.")

#### **PROPYLEA** MULSANT

##### **Propylea 14-punctata** (Linnaeus)

Yvours, France, Aug. 1900 (Koebele), 1; Waldkirch, Baden, Germany (Koebele), 8.

##### **Propylea 14-punctata japonica** (Thunberg)

Japan (Koebele, No. 1236), 13; China (Koebele, No. 1339), 2.

The two from China and two from Japan belong to the var. *dioncea* (Mulsant); five from Japan to the var. *tessellata* (Weise) and the remainder to the var. *ancora* (Weise).

("1236. Miyanoshita and Atami upon various plants, not yet found upon any particular food aphid. Sent to Honolulu.")

"1339. One specimen only upon *Paliturus ramosissimus* Poir. Kowloon, November 1895. One specimen on screw palm, Swatow, Nov. 12, 1895.")

#### **PROTOCARIA** NEW GENUS

Allied to *Propylea* Mulsant and similar in size, form and appearance. Epipleura of elytra distinctly more descending externally. Legs shorter, the hind pair reaching to middle of

epipleura (almost to outer edge in *Propylea*). Femora broader, the claws smaller, with a smaller rounded basal tooth. Anterior edge of mesosternum weakly emarginate in middle (rather deeply emarginate in *Propylea*). Metasternal lobe between middle coxae narrowed to a more or less obtuse point (broadly truncate in *Propylea*). Coxal plate of first ventrite with a distinct oblique line (the line faint or absent in *Propylea*). Antennae considerably shorter, joints 3 to 6 being at most hardly more than twice as long as thick, 7 and 8 hardly longer than wide, the eighth strongly widened toward apex and rather distinctly forming a part of the club, joints 9 and 10 broader than long, and the last joint about as long as wide and obliquely truncate. (In *Propylea* antennal joints 3 to 6 almost three times as long as thick, 7 and 8 about twice as long as thick, 9 and 10 distinctly longer than wide, and the last joint about twice as long as wide and rounded at apex.) Median process of prosternum with two parallel carinae, lying close together and reaching about three-fourths of the distance to anterior margin of segment. Prothoracic foveae practically as in *Propylea*.

Median lobe of tegmen depressed, nearly three times as long as wide, the lateral margins parallel at base, converging, however, in apical third, but the apex broadly truncate and strongly curved upward. Width of the apical truncation of this lobe about one-third of the greatest width of lobe. Dorsal surface of lobe well rounded from side to side on the basal half. Paramera rather short and stout, almost straight, well separated from each other at base, and slightly thickened at apex. They reach nearly to the apex of the median lobe and are cирrate on inner margin nearly to the base and on outer margin nearly to the middle. Sipho short, moderately slender, abruptly narrowed in the apical eighth and having the extreme apex abruptly bent downward in a right angle, with a minute membranous expansion.

Genotype: *Protocaria scalaris* n. sp.

#### **Protocaria scalaris** n. sp. (Plate I, Fig. 16)

Testaceous yellow, the vertex, large mark on pronotum, elytra except pale marking, and under parts black, but epipleura of elytra and of prothorax, the mesepisternum and legs, excepting middle and hind coxae, pale. The prothoracic mark variable. In one female paratype the pronotum is largely black, with the lateral margins, broadly in front, narrowly in rear, pale. The black area in this specimen reaches the anterior margin and is slightly notched in the middle anteriorly. In the other types the black area is less extensive and does not quite attain the anterior margin and is more or less bilobed meso-anteriorly. These anterior lobes either almost squarely truncate or obliquely rounded, depending on whether the median pale notch is deep and narrow, or short and spreading. Outer margin of the black lobes meeting the basal black area more or less squarely. The pale side margins very narrow behind, and more or less abruptly and greatly widened in front. Elytra with lateral margin broadly and three more or less oval or round spots on the disk, yellow, producing a scalariform design. Anterior spot touching basal margin, smaller and more triangular than the other two, rather more closely approaching the suture than the humerus. Second spot largest, before the middle (its hind margins at or slightly before the middle), and usually more or less oblique. Posterior spot placed half way between middle and apex and in Japanese paratypes more rounded than the others. These spots vary considerably in size. In the type and allotype (Formosa) they are large, or wider than the black intervals between them, and both the middle and posterior spots are oval and oblique. The yellow lateral margin undulate within, widest at the base and at the middle. The widening at the middle forms a deep broadly rounded indentation in the black area opposite the interval between middle and posterior spots. In one paratype (Japan) the black area extends into the yellow lateral margin in two definite broad lobes, almost directly opposite the middle and posterior discal spots, and almost dividing the yellow border into three spots. Frons and pronotum very finely and closely punctured, elytra much more distinctly and more sparsely punctured. Length, about 3 to 4 mm.

The Japanese specimens have elytral puncturation usually slightly stronger, the three discal spots smaller, with the posterior one more rounded and less oblique than in the Formosan type.

Formosa (Koebele, No. 1238), 1 ♂, 1 ♀ (holotype ♂ and allotype); Japan (Koebele, No. 1238), 2 ♀ (paratypes); and Gifu, Japan (Y. Nawa), 1 ♂, 1 ♀

(paratypes). Allotype and one paratype (Japan) in Koebele collection, the remainder in the U. S. National Museum.

("1238. Two specimens only, Atami, Japan, April 1895. Three specimens at Tamsui, Formosa, December 1895.")

#### CARIA MULSANT

##### **Caria dilatata** (Fabricius)

China (Koebele, No. 1333), 1 female; Hongkong, China (Koebele, No. 1333), 3 females.

("1333. First found with *Synonycha grandis* upon *Bambusa* infested with *Oregma bambusae* Buckton, at Hongkong, China. Again at Kowloon, Hongkong, Nov. 3, 1895, upon *Celtis* infested with a whitish cottony covered aphid. Also upon *Stillingia scifera* infested with aphids and leafhopper. Nov. 6, 1895, again one specimen with *Synonycha grandis* upon aphis on bamboo.")

#### CYPHOCARIA CROTCH

##### **Cyphocaria duvaucelii** (Mulsant)

China (George Compere), 1 female.

#### ARTEMIS MULSANT

##### **Artemis circumusta** Mulsant (Plate II, Fig. 17)

China (Koebele, No. 1338), 1 female, belonging to the var. *mandarina* Mulsant.

("1338. One specimen only, upon mulberry badly infested with a small *Psylla*, causing the leaves to curl up. Feb. 22-Mar. 6, 1900, several specimens found at above place, Kowloon, sent to Mr. Craw and liberated (2) at Honolulu.")

#### LEMNIA MULSANT

##### **Lemnia biplagiata** (Schönherr)

China (Koebele, No. 1317), 2 females; Hongkong, China (Koebele, No. 1317), 4 males, 1 female.

("1317. On pine infested with *Lachnus*, Hongkong, Macao, no doubt feeding upon the plant lice. More numerous upon trees infested with *Lecanium* and *Pulvinaria* at Kowloon, Nov. 8, 1895. At Kowloon, many more upon *Celtis* and trees around same. On orange and *Psidium* infested with *Lecanium* and *Pulvinaria*. Common at Kowloon, Nov. 18, 1895.")

##### **Lemnia biplagiata personata** (Weise)

Formosa (Koebele, No. 1345), 1 male.

("1345. Common upon aphis on rose, *Lachnus* on pine, on tea plants, etc. many specimens. Tamsui, Formosa, Dec. 6, 1895, chiefly on rose aphis.")

##### **Lemnia saucia calypso** (Mulsant)

China (Koebele, No. 1346), 4 males.

("1346. Resembling the foregoing [1345] but always with the red spot much smaller. Common at Swatow, hibernating on various trees and shrubs, Dec. 11, 1895. Honolulu, March 4, 1896, many specimens on aphis on orange at Mr. Jordan's.")

### COELOPHORA MULSANT

The type of *Coelophora* is *inaequalis* Fabricius, as designated by Crotch in 1874. Before proceeding with the enumeration of the species of *Coclophora* contained in the Koebele collection it is well to call attention to the numerous forms that have been assigned by various authors to *inaequalis* and the difficulties involved in determining the proper use of the names proposed by Fabricius and Thunberg.

According to the nomenclature used by most modern authors *inaequalis* includes a complex of forms ranging from the Australian continent on the south, northward through the Malayan Archipelago to the Philippines. Crotch records *inaequalis* from Japan but I have not seen it or anything similar either from Japan or the coast of China. As the distribution is mainly insular it is probable that any structural difference that may exist would not prove to be exactly or completely intergradant from one island group to the next.

On comparing the male genitalia of the Australian and Philippine forms assigned by authors to *inaequalis* one will find a notable difference. Moreover the genitalia of allied forms from Java, Borneo, and other islands differ from the Australian or Philippine forms although closer to the latter. The material that I have been able to study is too inadequate to elucidate the problems, except partially, but I venture the opinion that the Australian and Philippine forms should be segregated at least as subspecies. The application of the names proposed by early authors, however, remains to be settled. The habitat of species described by Fabricius and Thunberg is apt to be vaguely indicated at the best, and the proper application of names on the basis of distribution may be doubtful. I believe, however, that the name *inaequalis* is applicable to the Australian species and that no name is available for the Philippine form.

A word is necessary about the color phases of *inaequalis* and allied species. In 1922 (Proc. Haw. Ent. Soc. 5, pp. 121-133) I showed that the Australian *inaequalis* has three phases, one of which, a nearly all black form, is a Mendelian recessive to the other two. This black form is the *Coelophora mastersi* of Blackburn. The other variant is a form showing nine small black spots or dots on the elytra. This is the *C. 9-maculata* (Fabricius). I have not seen any color phases corresponding to these from the Philippines, but in the Malayan Archipelago there seems to be a multiplicity of forms.

#### ***Coelophora inaequalis* (Fabricius)**

Australia (Koebele, No. 17 and 1017), 3; Sydney, New South Wales (Koebele), 1; Brisbane, Queensland (Koebele), 1; Kuranda, Queensland (Koebele), 1; Bundaberg, Queensland (Koebele), 8, one marked Oct. 1904; Cairns, Queensland (Koebele), 6; Hawaii (Koebele, No. 1017), 2.

("1017. Three specimens found upon lemon trees at Parramatta, New South Wales, Oct. 28-30, 1892, probably feeding upon aphid in larval state. Feb. 1, 1893. Found everywhere in places visited up to date and always upon Aphidae. At Toowoomba, on woolly aphid (?), very numerous. At Clarence River upon aphid on orange. Parasite on larva bred. Johnston River, etc. Also New Caledonia and Fiji.

"Common all over and around Honolulu, March 4, 1896. Bred parasites, May 6, 1896, Honolulu. Mr. Wait informs me that this parasite has been observed long

on the Islands upon *C. abdominalis* and is very numerous on that species in North Kona, Hawaii. Has spread on all the islands up to the highest mountains within two years, 1894-1896.

"July 23, 1896, at Kilauea, Kauai, millions on aphis infesting sugar cane, which they cleaned out in three weeks or so.

"Aug. 3, 1896. Mr. John Kidwell, Manoa Valley, reports that owing to this beetle, the disease so prevalent on the taro had entirely disappeared, although the aphids were still present.

"September-October, 1896. Found badly parasitized on every Island visited and especially so at Kona and Lahaina.")

#### ***Coelophora inaequalis*, var. 9-maculata (Fabricius)**

Australia (Koebele, No. 1158), 3; Toowoomba, Queensland (Koebele, No. 95), 1; Bundaberg, Queensland (Koebele), 1; Cairns, Queensland (Koebele, No. 1158), 18.

("1095. One specimen only at Toowoomba upon orange, April 9, 1892. At Bundaberg, Queensland, June 1904, on sugar cane, likely upon aphis. Also again at Kuranda, various plants, Hambleton, Mulgrave, Cairns, Queensland, upon sugar cane. July, September, 1904, a considerable number sent to Honolulu. September to October, 1904, at Bundaberg, rare on sugar cane and various trees, while beating, and few obtained to send to Honolulu."

"1158. Several specimens on various trees and shrubs at Kuranda, Queensland, July 1894. Had been observed feeding upon orange aphis on a citron tree.

"Aug. 6, 1894. Found male in copula with female No. 1160, on orange infested with aphids. Also noticed them copulating with *Coccinella repanda* [as *Coelophora inaequalis* was called by Koebele], and vice-versa.

"Three specimens mounted of typical form, formerly under *C. repanda*, collected at Sydney, New South Wales, January 1905.")

#### ***Coelophora inaequalis*, var. mastersi Blackburn**

Cairns, Queensland (Koebele, No. 1160), 5.

("1160. One specimen on orange at Kameranga, Queensland, apparently feeding upon aphids. Aug. 6, 1894, found female in copula with male No. 1158, upon orange tree.")

#### ***Coelophora inaequalis comperei* new subspecies**

Similar to typical *inaequalis* from Australia and commonly referred to it, but differing in details of coloration, sculpture and male genitalia.

Form as in *inaequalis*, but the insect, somehow, gives the impression of being more compact, with a thicker, or heavier, integument. Prothorax and elytra less shining, as finely punctured as in *inaequalis*, but having fine pellucid dots at the base and along outer margin of elytra and others in a line running back from the outer side of the callus. These dots resemble coarse punctures and are hardly indicated in *inaequalis*. Ground color a dull flavous or reddish as in *inaequalis*, including that of head, underparts and legs. (In *inaequalis* the femora, coxae and greater part of sternum and venter are black.) Base of pronotum black, the black area much wider in middle, reaching from base to apical fourth, and deeply and generally broadly emarginate in median line almost to the base. On each side the black area is comparatively narrow, either uniformly or with a dilation lateral. Markings of elytra as in *inaequalis* except that the outer margin is not blackened and the subapical spot and outer submedian spot do not reach the outer margin. Suture with a black vitta as in *inaequalis*, slightly dilated between the middle and scutellum and rhombically dilated behind. Basal spot with its outer margin resting on the callus, rounded or oval, with a broad stalk extending backward between the

submedian spots and thereby sometimes more or less joined to either one or both of these spots. Subapical spot less irregular in shape than in *inaequalis* and having the shape of a solid B, with the two lobes more or less well indicated and equal. (In *inaequalis* the inner lobe of the B is much larger than the outer lobe.) Length, 4.5 to 5.4 mm., width, 3.7 to 4.7 mm.

Male genitalia similar to those of *inaequalis* but differing as follows: Median lobe of tegmen distinctly broader, about four times longer than wide. (In *inaequalis* about five times longer than wide.) Apical half of ventral surface with a median keel or carina, on each side of which the surface is slightly concave. This apical bilaterally concave area bounded basad on each side by a carina curving off from the siphonal orifice to the lateral margin of the lobe. (In *inaequalis* these carinae turn backward and merge with the median carina near the beginning of the apical fifth of the lobe.) Tubercle bordering apex of siphonal orifice on ventral surface of lobe weakly developed and not distinctly protruding as seen in some allied forms. (In *inaequalis* this tubercle appears triangular in direct view and moderately projecting in profile.) Sipho practically as in *inaequalis*, with two marginal scallops on each side just beyond the middle, and the apical part abruptly bent a little after the beginning of the last fourth, beyond which it tapers rapidly to a tenuous point. Ventral surface of sipho not or hardly bulging opposite the scalloped margin as in some forms of the *inaequalis* group.

Described from 8 specimens (holotype ♂ and paratypes) collected at Los Baños, Luzon, Philippine Islands, July 1916 (F. X. Williams), and 2 specimens (paratypes) from Manila (Geo. Compere) in the Koebele collection.

Types in collection of the Hawaiian Sugar Planters' Experiment Station.

#### **Coelophora veranoides** Blackburn

Windsor, New South Wales (Lea), 3; Mt. Victoria, Sydney, New South Wales (Koebele), 1; Harwood Island, New South Wales (Koebele, No. 97 and 97A), 3; Toowoomba, Queensland (Koebele, No. 97), 1; Bundaberg, Queensland (Koebele), 4.

("1097. Two specimens saved; one Harwood, Clarence River, New South Wales, Jan. 1, 1892, another at Toowoomba, Queensland, on orange.")

#### **MICROCARIA CROTCH**

Probably *Anisolemmnia* Crotch, 1874, is a synonym of *Microcaria* Crotch, 1871. I have not been able to see the type species (*A. complicata* Crotch) of *Anisolemmnia* but I have examined *A. ceramensis* Crotch and believe that it is congeneric with *M. mulsanti* (Montrouzier). *Coelophora jansoni* Crotch is also congeneric. Rye in 1873 (Zool. Rec. 8, p. 329) selected *mulsanti* as the type of *Microcaria*.

#### **Microcaria mulsanti** (Montrouzier)

New Caledonia (Koebele, No. 2416), 4.

#### **Microcaria jansoni** (Crotch)

Cairns, Queensland (Koebele), 3; Geraldton, Johnston River, Queensland (Koebele, No. 1182), 4.

("1182. At Geraldton, Queensland, Aug. 10-15, 1894, upon hibiscus tree, badly infested with a psyllid, five specimens of a coccinellid feeding upon those insects.")

#### **BOTHROCALVIA CROTCH**

*Coelophora pupillata* (Schönherr) falls in Bothrocalvia and it is almost identical in the male genitalia with *B. albolineata* (Schönherr).

#### **Bothrocalvia albolineata** (Schönherr)

China (Koebele, No. 1307), 54; Hongkong, China (Koebele, No. 1307), 9; Formosa (Koebele, No. 1307), 3.

("1307. Common upon *Pinus sinensis* at Hongkong, China, Oct. 19, 1895. As yet I have no idea upon what this may live.

"Pines infested with *Lachnus*, Macao, Oct. 23, 1895. Bred from larva feeding upon *Lachnus*. Always on *Lachnus* on pine.

"At Tamsui, Formosa, upon *Pinus sinensis* infested with *Lachnus*, all stages.")

#### **Bothrocalvia pupillata** (Schönherr)

China (Koebele, No. 1318), 2; Hongkong, China (Koebele, No. 1318), 7.

("1318. One specimen near Hongkong upon *Camellia*, which appeared to be clean, Oct. 26, 1895. Many at Kowloon upon *Stillingia sebifera*, *Celtis sinensis*, *Psidium* sp., etc., Nov. 8, 1895. About 1,000 specimens collected on *Celtis* and trees adjoining these. Larvae still present, pupa found on bark of branch.

"March 4, 1896, two specimens upon orange infested with aphis. Honolulu. Aug. 12, 1896, one specimen in nursery upon cashew, *Anacardium occidentale*. Again at same place, Nov. 10, 1896.")

#### **Bothrocalvia pupillata**, var. *annectans* new var. (Plate II, Fig. 18)

Agreeing with typical *pupillata* except as follows: The two subsutural black spots on each elytron instead of being separately ocellated with a pale ring are enclosed within two pale vittae joined at their ends. The black spots are placed at the ends of this enclosure. The three submarginal spots on each elytron are separately ocellated as in *pupillata* but the pale rings are joined together by a pale vitta. This vitta runs tangent to inner margin of the ocellation of the middle spot, and hits the inner posterior edge of the subhumeral ocellation and the outer anterior edge of the subapical ocellation. These markings, therefore, are an almost exact combination of the black spots of *pupillata* and the vittate markings of *albo-lineata*. The male genitalia of *annectans* are exactly as in *pupillata* and differ hardly at all from those of *albo-lineata* except in having the paramera distinctly more slender and much more arched dorso-ventrally in the basal half.

Described from 4 specimens (holotype and paratypes) from China (Koebele, No. 1318). According to Koebele's field notes, the type locality is Hongkong and vicinity.

#### **PHRYNOCARIA** NEW GENUS

Having the characters of *Coclophora* Mulsant in general, but distinguished as follows: Frons comparatively narrow, at its narrowest part about, or even less than, one-third the total width of head, with the inner orbits of eyes strongly diverging anteriorly. The greater width of frons in *Coclophora* seems to be partly in consequence of the smaller size of the eyes and partly in consequence of the larger size of the whole head. The postantennal canthus of *Phrynocaria* is narrow and rather deep; in *Coclophora* it is much broader exteriorly and the emargination of the eye therefore appears to be shallower.

Median lobe of tegmen short and broad, not greatly longer than broad, strongly depressed above and beneath, strongly arcuate on the sides and roundish at apex, with a minute median nipple like projection. Paramera well separated at their bases, slender, gently curved and somewhat surpassing apex of the median lobe. Sipho rather short, moderately slender, tapering to a fine point at apex, but not tenuous and not expanded between the middle and beginning of the apical third. It is also more chitinized, with much less evident separation of the component strands than in allied *Coclophorinae* genera, and is armed near beginning of the apical third, or between that point and the middle, with a laminate projecting lobe on each side from the ventral wall. These lobes form more or less evident retrorse hooks, especially well chitinized and conspicuous in *congener*.

Genotype: *Coccinella congener* Schönherr.

#### **Phrynocaria congener** (Schönherr)

China (Koebele, No. 1327), 13; Hongkong, China (Koebele, No. 1327), 2.

("1327. Four specimens, Hongkong, China, Oct. 29, 1895; one male with sides of thorax white, on pine; the others on *Psidium* infested with *Lecanium* and *Pulvinaria*."

**Phrynocaria congener, var. approximans** (Crotch)

China (Koebele, No. 1331), 17.

I have thrown these together as forms of one species on account of the identical structure, including that of the genitalia. The median lobe of the tegmen in this species is shorter and broader than in *gratiosa* and the siphon has much better developed retrorse hooks which are situated at the beginning of the apical third.

("1331. Resembling 1318, yet smaller, sides of thorax white and but four black spots on elytra. Five specimens, Kowloon, Hongkong, Nov. 3, 1895, with 1318 upon *Celtis* chiefly infested with an aphid. Nov. 8, 1895, several more upon *Celtis* and pine at Kowloon. Food not yet observed. On orange infested with *Lecanium* and *Pulvinaria*, Kowloon, Nov. 18, 1895.")

**Phrynocaria gratiosa** (Mulsant)

In this species the median lobe of the tegmen is about or nearly twice as long as wide, and the hooks of the siphon are small and membranous and situated about half-way between the middle and the beginning of the last third.

In 1894 Mr. Blackburn (Trans. Roy. Soc. Aust. 18, p. 338-339) reported on a series of specimens of this species sent to him by Mr. Koebele and remarked that, if he was right in associating the remarkable series of variations, the species was one of the most variable of the Coccinellidae. He then describes, without naming them, some nine variations, including the typical form. It seems desirable to have names for the major types of variation and I consequently name those found in the Koebele collection. This is the more important as some of them look like distinct species, and may actually be distinct, although on account of the identical genitalia I am persuaded to place them together here as varieties. As Mr. Koebele had included all these variations under his No. 1139, he had evidently reached the same conclusion by field observations.

("1139. Numerous at Brisbane upon various trees in larva, pupa and imago state, feeding upon *Lecanium depressum*. A very variable species. Many mounted, others sent to Honolulu. Many bred from light colored pupae. A few specimens at Toowoomba, April 28-30, 1897, upon orange, no doubt feeding upon *Lecanium*. Common near Bundaberg, Queensland, during early spring near sea-shore, but not breeding, September and October, 1904.")

**Typical *gratiosa*** (Plate II, Fig. 19)

Bundaberg, Queensland (Koebele), 1 female.

Elytra black, with a broad transverse band at base of each and large mark at apex, yellow. The entire margin of each elytron is black although very narrowly so across the base. The common median black band extends triangularly forward to the scutellum. Pronotum black, except narrow anterior margin, and a large oval mark on each side, not quite reaching base, which are yellow.

**Phrynocaria gratiosa, var. *flavoguttata* new var.** (Plate II, Fig. 20)

Bundaberg, Queensland (Koebele), 6 (holotype and paratypes); Toowoomba, Queensland (Koebele, No. 92), 1 (paratype); Brisbane (Koebele, No. 1139), 4 (paratypes), one of these also labeled "Toowoomba."

Similar to the typical form, but the basal pale band divided into two marks by an extension of the black over the callus to the base, and the median black band enclosing two large pale marks on each elytron. The black thus forms a reticulate pattern, with five large pale marks on each elytron. Mark 1 between callus and suture at base, subquadrate, with inner margin oblique. Mark 2 on outer side of callus at base paralleling the outer margin for nearly one-third the length of the elytron, and emarginate on inner side by the black callus. It is thus subreniform or like a thick inverted comma. Mark 3 triangular and 4 subquadrate, forming with those of other elytron a transverse series just behind the middle. Mark 5 apical and practically as in typical form. Minor variations of this general type are as follows:

1. Marks 3 and 4 confluent to a more or less degree.
2. Mark 4 connected with 5 at their outer margin by a slender pale line paralleling the elytral margin. This variation sometimes combined with the preceding.
3. Marks 1 and 2 confluent as in typical *gratiosa*, or with an isolated small black spot left on callus. This may occur in conjunction with the union of marks 3 and 4, so that each elytron is pale, margined all around with black and with two transverse irregular black bands at about two-fifths and two-thirds of the length.

The pale coloration in *flavoguttata* varies from reddish yellow to creamy white. The pronotal markings typically as in *gratiosa*. In the minor variations the black area may cover about three-fourths of the length, leaving a much broader pale anterior border, and it may also become deeply emarginated by the pale color in the median line nearly to the base.

#### *Phrynocaria gratiosa*, var. *palens* new var. (Plate II, Fig. 21)

Brisbane, Queensland (Koebele, No. 1139), 2 (holotype and paratype).

This differs from *flavoguttata* by the entire lack of the black reticulate pattern, the margins only remaining black, with the sutural border dilated between the middle and the scutellum. Pale color of pronotum and elytra creamy white, or white marked with testaceous. In the type each elytron has a large testaceous brown cloud across the middle, not quite reaching the black marginal border and enclosing an oval creamy white mark between itself and the black suture just behind the dilation of the latter. The base with a broad transverse band of creamy white, the apex with a large mark of the same color, the two being joined next to the outer margin by a white line lying between black and brown areas.

In the other specimen the brown cloud extends forward to the base and encloses a broadly oval creamy white mark between itself and the black sutural dilation at the base. The oval creamy white spot next to the suture just behind the middle is present but smaller than in the type. The apical creamy white mark is also smaller. The brown cloud is separated from the black border of outer margin by a narrow pale vitta from base to apex, this vitta being whitish, marked with testaceous brown.

The black area on pronotum as in typical *gratiosa* except that its anterior margin may have a small triangular median emargination and a small whitish spot is present in the median line just before the base.

#### *Phrynocaria gratiosa*, var. *nigrocincta* new var. (Plate II, Fig. 22)

Bundaberg, Queensland (Koebele), 10 (holotype and paratypes); Toowoomba, Queensland (Koebele), 1 (paratype).

Differs from the preceding varieties in having the disk of pronotum and of each elytron a unicolorous tawny (dull brownish yellow). Pronotum narrowly margined with black on the outer margin from the middle to the base. The basal margin also is narrowly margined with black but this black portion is mostly normally covered by the elytra. Scutellum black. Basal and sutural margin of the elytron very narrowly margined with black, the outer margin with a rather narrow black border, narrowed behind, precisely as in preceding varieties. There is sometimes a black dot on the callus (present in six out of eleven specimens, but absent in holotype), and in one specimen there is a black dot at the anterior third and barely closer to the suture than to the outer margin.

This is the var. G of Blackburn and very likely the insect recorded by Crotch from Australia as *Coclophora versipellis* Mulsant, but *versipellis* is a genuine *Coclophora*, closely allied to *C. inacqualis* (Fabricius).

**Phrynocaria gratiosa**, var. *nigrovittata* (Blackburn) (Plate II, Fig. 23)

Bundaberg, Queensland (Koebele), 5; Toowoomba, Queensland (Koebele, No. 1139), 1; Brisbane, Queensland (Koebele, No. 1139), 2; Cairns, Queensland (Koebele), 2.

In this variety each elytron has the sutural and outer margin bordered with black and three black vittae on the disk. The basal margin of the elytron is also narrowly margined with black. The sutural border is uniform in width and is abbreviated just behind the scutellum. The middle vitta extends from the callus to apical seventh but is usually interrupted subapically. The remaining portion of this vitta is broadly twice indented on its inner margin, or even interrupted, in which case the vitta is broken into four spots. The outer vitta joins with the middle one at the callus. The inner vitta parallels the suture and extends to the beginning of the apical third. The pronotum has an irregular black border across the base and on the posterior half of the lateral margins. On the anterior middle of the disk is a black mark shaped much like a spread butterfly, facing forward.

This was described by Mr. Blackburn as a distinct species in 1895 (Trans. Roy. Soc. So. Aust. 19, p. 237) and certainly looks distinct, but the male genitalia are precisely as in the preceding varieties.

**Phrynocaria gratiosa**, var. *koebelei* new var. (Plate II, Fig. 24)

Bundaberg, Queensland (Koebele), 9 (holotype and paratypes); Cairns, Queensland (Koebele), 2 (paratypes); Brisbane, Queensland (Koebele, No. 1139), 1 (paratype); Australia (Koebele), 1 (paratype).

This differs from all the preceding varieties in lacking the black border on outer margin of elytra. The sutural border is somewhat dilated anteriorly and more or less distinctly abbreviated just behind scutellum. It has also a slight punctiform dilation close to the sutural angle. The basal and outer margins are either entirely pale or extremely narrowly edged with black on the marginal bead (as in holotype). Disk of each elytron with four (or five) rather large black marks. Marks 1, 2 and 4 forming an interrupted vitta from callus obliquely to apical fourth of length and inner third of width. 1 + 2 extends to the middle of length and is dilated behind the callus on inner side. Rarely it is divided into two spots: 1 small, on the callus, and 2 much larger behind. Mark 3 lying half way between the portion 2 or 1 + 2 and the outer margin of elytron. Mark 4 somewhat obliquely oval, its inner posterior margin more or less approaching the sutural border. Mark 5 quadrate or triangular, often larger than either 3 or 4 (larger and triangular in holotype) and lying between mark 4 and outer margin and usually about equally distant from each. Ground color either unicolorous tawny (holotype), or sometimes with five paler areas corresponding more or less exactly in position and form to the pale guttate marks of *flavoguttata*. In such cases the black marks are bridged together by the tawny ground color to form a more or less evident reticulate pattern. In one paratype the ground color is very pale tawny and the five paler areas almost creamy white. Pronotal pattern similar to that of typical *gratiosa*, or *flavoguttata*, but with apical pale border broader and with a pale mark (or two dots) in the middle before the base. The latter mark varies greatly in size and sometimes extends laterally to isolate a black butterfly-shaped mark as in *nigrovittata*.

This variety seems to be derived from *flavoguttata* by the loss of the marginal border and by having the black reticulate pattern interrupted in such a manner that only a small portion of the longitudinal and transverse bars remain.

**EOCARIA** NEW GENUS

Form broadly oval, with coloration scheme as in *Vibidia*. Pronotum with the outer margins gently arcuate and convergent in front, the posterior corners subangulate. Thoracic epipleura

with a distinct oval fovea. Elytra somewhat broader than base of pronotum, moderately exaplate on outer margin, the epipleura rather less wide than in *Coelophora*, almost horizontal and very slightly foveate to receive apex of hind femora. Prosternal process bicarinate, the carinae parallel and extending about three-fourths of the distance to the anterior margin of segment. Mesosternum deeply and angularly emarginate in the middle. Metasternum transverse between the middle coxae. Coxal lines of first ventrite curving backward and outward from the base and becoming confused with the posterior margin of the segment. Frons moderately narrow, the inner orbits of eyes distinctly convergent behind. Antennae rather long, reaching to the front coxae. Joints 3 to 8 slender, much longer than thick, except 7 and 8 which are only slightly longer than thick. Joints 9 to 11 forming a club, with 9 and 10 both much wider at apex than at base, 9 slightly longer than wide and 10 about one and one-third times wider than 9 and barely wider than long. Joint 11 broadly oval, about one and one-fourth times longer than wide and truncate at apex. Punctuation of pronotum rather fine and close, that of elytra a little sparser and rather distinctly unequal.

Median lobe of tegmen as seen from above very narrow at base, abruptly bent downward near the beginning of the second fifth and at the same point beginning to expand into an elongate oval body, which is narrowed into a slender upturned point at apex. As seen from the side the median lobe is strongly compressed beneath in the constricted basal part and depressed on apical half both above and beneath. Paramera slender throughout, almost perfectly straight, reaching to the apex of median lobe and strongly ciliate at apex and on outer margin as far as the middle. Sipho short and rather stout, moderately swollen from middle to beginning of the apical third, with evident separation of the dorsal strands, and armed beneath near apex of swelling with a pair of small hook-like processes from the ventral strands. Just beyond the swelling the dorsal strands are twisted one over the other and rapidly taper into a slender part which is slightly constricted close to apex. The short portion beyond the constriction more membranous and bent slightly downward.

From *Coelophora* this genus differs in the broadly oval form, with the posterior angles of pronotum much more evident, the frons narrower (but not so narrow as in *Phrynocaria*), and the sternum much more convex. With *Propylea* it agrees in general form and structure, but the prothoracic foveae are rather more evident, the frons decidedly narrower, the elytral punctuation distinctly unequal and the coloration and male genitalia very different.

Genotype: *Eocaria muiri* n. sp.

#### ***Eocaria muiri* new species (Plate II, Fig. 25)**

Japan (Koebele, No. 1237), 1 ♂, 1 ♀ (holotype ♂ and allotype).\* Also two paratypes collected in Japan (Okitsu, June, 1913, and Karuizawa, Aug. 1913) by Frederick Muir and in the collection of the Hawaiian Sugar Planters' Experiment Station. Also the following paratypes in U. S. National Museum: 1 ♂, 1 ♀, Karuizawa Mts., Japan; 2 ♀, Kyoto, Japan; 1 ♂, Shin Kai Si, Mt. Omei, 4500 ft., Szechwan, China, Aug. 7, 1929 (D. C. Graham); and 1 ♂, 2 ♀, Suifu, Szechwan, China, 1922, and June 21, 1928 (D. C. Graham).

Very similar in size, coloration and markings to *Vibidia 12-guttata* (Poda), with which species it has been found confused in collections, but somewhat more broadly oval, the pronotum with four white spots across the base instead of two, and the two outermost spots on each elytron widely separated from the margin.

Rich orange brown or fawn color above and beneath, with the palpi, antennae and legs about concolorous. Mesepimera, anterior corners of pronotum, and frons, more or less, creamy white. Pronotum also with four creamy white spots at the base. The two inner ones placed on either side of middle, diverging in front and usually not quite touching the basal margin. The other two broader, either quadrate or rounded, and placed on the basal margin just within the posterior angles. Each elytron with six oval, or broadly oval creamy white spots, of nearly

\* For Koebele's field note, see *Vibidia 12-guttata* (Poda), with which this species was confused.

the same size and arrangement as in *Vibidia 12-guttata* (Poda) except that the two outer spots (3 and 5) are well removed from the lateral margin. Spot 6 usually more or less quadrate and transverse, the others having their longer axis parallel to the suture. Spots 1, 4 and 6 equidistant from the suture, and 2 about twice as far removed. Spot 3 placed behind and slightly exterior to the callus. Spots 2 and 4 are each somewhat posterior to 3 and 5 respectively. The channel paralleling the lateral margin is more or less whitish, especially at the basal and apical angle. At the latter angle it is often dilated into a well defined creamy white spot which may be more or less confluent with spot 6. Male genitalia as defined under the generic heading.

Length of Japanese specimens, 4-5 mm.; of the Szechwan specimens, 5.25-5.5 mm.

#### GYROCARIA NEW GENUS

Form subhemispherical, or very broadly oval, the elytra at base only slightly wider than pronotum. Sides of pronotum gently rounded, convergent in front, and very finely margined. Head rather large, the frons broad, the inner orbits of eyes subparallel. Canthus of eye rather deep and narrow. Clypeal margin slightly emarginate. Antennae rather short, not surpassing anterior margin of front coxae. Antennal joints 3 to 7 very slightly longer than thick, 8 as long as wide, 9 and 10 transverse, 11 wider than long, obliquely rounded at apex. Joints 8 to 11 forming a compact club. Epipleura of prothorax shallowly foveate on inner margin anteriorly, the fovea covering about one-fifth to nearly one-third of the length. Prosternal process rather short and broad, only slightly surpassing front coxae, with two submedian longitudinal carinae, which extend considerably in front of the coxal cavities. Mesosternum broadly and rather shallowly emarginate medially, its anterior border sharply declivous. Metasternum truncate and rather broad between middle coxae. Coxal lines of first ventrite curving outward to hind margin of segment, the oblique line present but indistinct. Elytra subexplanate and strongly margined at sides, the epipleura rather broad, descending externally and subfoveate to receive apex of hind femora. Puncturation fine but rather strong, more or less coarser on explanate outer margin of the elytra, and sometimes slightly unequal on their disks. Fifth ventrite in male strongly and very broadly emarginate at apex, the sixth much less broadly emarginate, but exposing a very short seventh segment. Pronotum black, the sides broadly white or pale yellow. Frons in female black, pale in male.

Median lobe of the tegmen short, depressed, deeply emarginate at apex, the process on each side of emargination acute (the structure resembling an old-fashioned bootjack and recalling condition found in *Synharmonia*, but the lobe much shorter, not turned upward at apex and much more deeply emarginate). Paramera short and straight, equaling the length of median lobe and well separated at base. Sipho short, rather stout, and rather abruptly tapering in the apical tenth into a very fine membranous point.

Genotype: *Coclophora guttata* Blackburn.

#### *Gyrocaria guttata* (Blackburn) (Plate II, Fig. 26)

Australia (Koebele, No. 1159), 5; Cairns, Queensland (Koebele, No. 1159), 7 specimens, one of these also labeled "Kuranda, Geraldon."

("1159. One specimen at Kuranda, Queensland, on orange. Common at Geraldon, Queensland, and breeding upon psyllids infesting hibiscus tree, Aug. 10-15, 1894.")

#### AIOLOCARIA CROTCH

#### *Aiolocaria mirabilis* (Motschulsky)

Japan (Koebele, No. 1300), 5 specimens.

("1300. First observed at Gifu, Japan, beginning of April 1895, and said by Mr. Nawa to feed upon the eggs and larvae of a *Chrysomela* infesting willows. Here a number of specimens were found and forwarded to Honolulu. Eggs were present upon the trees in large numbers and some brought to Yokohama and placed

upon hibiscus infested with aphid, were lost sight of, evidently they will not feed on this. At the end of June, at Nikko, the beetle again was met with and feeding upon a chrysomelid larva infesting walnut; many eggs were noticed there as well. Without any doubt this would feed upon the potato beetle in America. Many eggs were found on walnut, where no trace of the chrysomelid was noticed. Still breeding during July upon coleopterous larvae on walnut. Noticed one larva running around on tree, upon which no more food was present, and meeting with a large syrphid larva it devoured the same. A chrysomelid was numerous and destructive on *Alnus incana* and none of these beetles were ever observed, but fed with these larvae in confinement they would devour the same. Mature insect was also observed upon willow, at Nikko, infested with a small blue chrysomelid, but the larva was not found.")

#### SYNONYCHA MULSANT

##### **Synonycha grandis** (Thunberg)

Ceylon (Koebele, No. 1200), 1; China (Koebele, No. 1200), 2; Hongkong, China (Koebele, No. 1200), 12; and 7 specimens without data.

("1200. Three specimens near Kandy, Ceylon, December 1894, feeding upon a large aphid infesting the bamboo plants. Found more numerous during January and February 1895, and always feeding on the large aphid, which according to Mr. Green is *Oregma bambusae* Buckton. Noticed eggs during January, yet these never hatched and no larvae were observed.

"Oct. 15, 1895, common at Hongkong, upon same aphid, in larva, pupa and imago stage. Swatow, China, December 1895.

"One apparently fresh specimen upon orange at Jordan's place [Honolulu] no doubt feeding upon aphid, May 6, 1896.

"Jan. 17, 1897, mounted parasites (*Homalotylus*) and secondary parasites from larvae collected at Hongkong, China, marked No. 1200.

"Feb. 28, 1900, a few aphids on bamboo at Hongkong but beetle not breeding yet, although present.")

#### CHEILOMENES CHEVROLAT

The type of *Cheilomenes*, as selected by Crotch, 1874, is *Coccinella lunata* Fabricius. The same species must be taken as the type of *Cydonia* Mulsant, so that the latter name falls in synonymy.

##### **Cheilomenes sulphurea** (Olivier)

Ukami, German East Africa, 1 male.

This is distinct from the South African *C. lunata* (Fab.), not only in the markings but also in the male genitalia.

#### MENOCHILUS NEW NAME

The genus *Cheilomenes* Mulsant and other authors, with *Coccinella sex-maculata* Fabricius as type, needs a new name and may be called *Menochilus*.

##### **Menochilus sex-maculatus** (Fabricius)

Ceylon (Koebele, No. 1217), 2; Formosa (Koebele, No. 1347), 1; Manila, Luzon (Geo. Compere), 1 specimen.

("1217. Three specimens brought to me and said to have been collected with No. 1209 amongst grass at Kandy, Ceylon, Jan. 10, 1895."

"1347. A few specimens only, hibernating on screw palm chiefly, Swatow China, Dec. 11, 1895. Also at Tamsui, Formosa, December 1895.")

**Menochilus quadriplagiatus** (Schönherr)

China (Koebele, No. 1316), 19; Hongkong, China (Koebele, No. 1316 and 1338), 24.

("1316. One pair in copula at Macao, China, Oct. 24, 1895, upon *Acacia* (?) infested with *Dactylopius*. Nov. 1, 1895, very numerous at Botanic Gardens, Hong-kong, feeding upon *Dactylopius* infesting a creeping *Ficus*, in larva, pupa and imago states, on aphids infesting *Hemerocallis*, in all stages; upon pine and various other trees. Common on weeds infested with aphis; in all stages at Kowloon, Nov. 18, 1895. Swatow, Dec. 11, 1895 and Kowloon, Dec. 13, 1895, common in all stages upon aphis on egg plant. From pupa likely of this insect, a parasite was bred and is marked 1316. Tetrastichine.")

For No. 1338 see *Artemis circumusta* Mulsant, with which Koebele evidently confused this species.

**HALYZIA** MULSANT

**Halyzia sedecim-guttata** (Linnaeus)

Waldkirch, Baden, Germany (Koebele), 5; Pelussin, France, August 1900 (Koebele ?), 1 specimen.

**NEOHALYZIA** CROTCH

**Neohalyzia perroudi** (Mulsant)

Mexico (Koebele, No. 1685), 1 female.

("1685. But two specimens, while beating at base of Popocatepetl, Mexico, May 1897, about 10,000 ft. elevation. A very peculiar pale form and resembling *Epilachna* except in want of pubescence.")

**VIBIDIA** MULSANT

**Vibidia duodecim-guttata** (Poda)

Japan (Koebele, No. 1237), 2 females.

("1237. Few at Miyanoshita and more at Atami, April 1895, upon various trees and not upon any particular food. Some sent to Honolulu. At Yokohama in larva state upon alder infested with mildew.")

**PSYLLOBORA** CHEVROLAT

As *Coccinella 20-maculata* Say, selected by Crotch, 1874, as genotype of *Psyllobora* was not originally included by Chevrolat, and hence not a valid type, I here-with select *Coccinella lineola* Fabricius, as the type of *Psyllobora*. *Thea* Mulsant is here included.

**Psyllobora luctuosa** Mulsant

Mexico (Koebele, No. 1648), 13; Guadalupe, D. F., Mexico, Nov. 1907 (Koebele), 2.

("1648. One specimen, beating at Oaxaca, Mexico, August 20, 1897. Very common on Popocatepetl, Mexico. Many mounted.")

**Psyllobora koebelei** Nunenmacher (Plate II, Fig. 27)

Arizona (Koebele, No. 2426), 1 male, 1 female.

I have labeled these paratypes as they are cited in the original description. According to Numenmacher the specimens were collected at Nogales, Santa Cruz County, in June 1902.

**Psyllobora parvinotata** Casey

Florida, 1 female.

I regard *P. pallidicola* Blatchley almost unquestionably as the same species as *P. parvinotata* Casey, after comparison of specimens collected by Blatchley at Dunedin, Florida, with Casey's type. The elytral pattern proved identical and the Blatchley specimens (also the specimen cited above) differed only in lacking the pronotal marks which are well developed in Casey's type.

**Psyllobora viginti-maculata** (Say)

West Point, Nebraska, May 1888, 1.

**Psyllobora borealis** Casey

Oregon (Koebele), 5; Easton, Washington (Koebele), 2.

**Psyllobora taedata** Leconte

Alameda, California, April (Koebele), 1; Oregon (Koebele), 1.

**Psyllobora deficiens** Casey

Santa Cruz Mountains, California (Koebele), 1.

**Psyllobora renifera** Casey

Sonora, Mexico (Koebele, No. 1679), 4; Arizona (Koebele, No. 2418), 4; Argus Mountains, California, April 1891 (Koebele), 4; Panamint Valley, California, April 1891 (Koebele), 1.

("1679. Five specimens, beating at Hermosillo and Guaymas, Sonora, Mexico, April 1897. This insect [considered by Koebele to be the same as *P. taedata*] lives upon mildew on grape, rose, apple, etc.")

**Psyllobora juvenca** new species (Plate II, Fig. 28)

Similar to *P. renifera* Casey, but spots 1 and 3 free (1 sometimes joined laterally with 2), the others joined to form an irregular-shaped longitudinal mark, broadly incised at one-third and near the middle and nodosely enlarged on each side at two-thirds. Differs from *P. taedata* Lee. and *P. 20-maculata* (Say) in having dark markings of elytra distant from lateral margin. In respect to male genitalia similar to *P. renifera* Casey, but siphon slightly longer, the median lobe of tegmen less slender, compressed at base, slightly obtuse at apex which is only slightly upturned.

Described from 3 specimens, in collection of the Hawaiian Sugar Planters' Experiment Station, two of them belonging to the Koebele collection: 1 ♂ (holotype), Cuautla, Morelos, Mexico (Koebele); 1 paratype, Morelos (Koebele); and 1 paratype, El Potrero, Vera Cruz, Mexico (H. T. Osborn).

**Psyllobora vigintiduo-punctata** (Linnaeus)

Lyons, France, May 1897, 1 male; Waldkirch, Baden, Germany (Koebele), 5.

### ILLEIS MULSANT

This genus is very distinct from other Halysine genera in the structure of the antennae and maxillary palpi. The antennae are elongate, distinctly surpassing front coxae. Joints 3 to 5 considerably longer than wide, 7 also longer than wide,

but 6 and 8 shorter, sometimes much shorter, than the joints between which they are placed, and usually about as long as wide. Joints 9 to 11 forming a very loose club, 9 and 10 widening toward apex, where they are not greatly wider than the apex of joint 7. Apical joint, however, considerably wider than the preceding joints, and ovoid to subrotund in shape. Apical joint of maxillary palpi in the form of a transverse elongate-ellipsoid disk, attached to the preceding joint at the middle of its basal surface. Its outer surface is transversely creased.

Mulsant (1850) placed the species of *Illeis* under *Psyllobora* but separated them as a subgenus under the preoccupied name *Egleis* (p. 167). In the Appendix (p. 1026) he indicates that his key line, "A. Dernier article de la massue des antennes, ovoide, court (*G. Egleis*)," should have preceded *P. galbula* on page 166 instead of *P. cincta* (p. 167), and substitutes *Illeis* for *Egleis*. In the body of the work he thus actually included *P. cincta* (Fab.) and *P. bistigmosa* Mulsant under *Egleis*, and in the appendix added *P. galbula* Mulsant, under the substitute name, *Illeis*. *Psyllobora galbula* Mulsant is here designated as the type of *Illeis*.

Weise, overlooking *Illeis*, proposed *Leptothea* (Arch. Naturges., 64, p. 227, 1898) with *Psyllobora galbula* as the type.

#### *Illeis galbula* (Mulsant) (Plate II, Fig. 29)

Australia (Koebele, No. 18, 481 and 1018), 13: Toowoomba, Queensland (Koebele), 1; Cairns, Queensland (Koebele), 6.

"481. A black and lemon-yellow coccinellid found only with the woolly aphis, numerous at Gordon, New South Wales, and also at Toowoomba, Queensland. Never met with this insect except feeding on above insect."

"1018. Found first at Gordon, N.S.W., upon apple trees infested with woolly aphis. Also at Toowoomba, Queensland, Nov. 9, 1892, upon same trees. At this place the eggs were found on trunk of an old Northern Spy. Many in spider's nest, also young larvae, no doubt feeding upon mildew."

"Nov. 14, one specimen upon orange at Parramatta, New South Wales."

"Nov. 19, placed large larva with aphis; this pupated two days later without feeding. Young placed with same food, yet got lost."

"One specimen at Harwood, New South Wales, and more on way to Richmond River, many upon orange. Baron River, Queensland, July 1894, one specimen."

"Jan. 2, 1899. Mr. Compere brought to me one dead specimen found in hospital grounds, Honolulu, under croton plant, upon which two living specimens were observed.")

#### *Illeis cincta* (Fabricius)

Ceylon (Koebele, No. 1210), 6 females. A male with the same data was found in the collection of the Citrus Experiment Station.

"1210. One specimen by beating *Pittosporum* near Kandy, Ceylon, Jan. 1-7, 1895. One more running around tips of a plant, yet not any food could be observed."

"Sent to me by Mr. Green in all stages upon mulberry at Yokohama and elsewhere, Japan, on various trees, mulberry, *Alnus*, etc."

"At Hongkong, Oct. 19, on *Pyrus sinensis*, and very numerous upon *Stillingia sebifera*, where they breed upon mycelium."

"Common at Tamsui, Formosa, December 1895.")

### **Illeis confusa new species**

Like *I. cincta* (Fab.) and not distinguishable except by the male genitalia. Median lobe of tegmen acicular, strongly compressed and much deeper than wide in basal half, depressed, i.e., thin dorso-ventrally, and strongly curved upward at apex. In *cincta* (from Ceylon) this lobe is not distinctly curved upward at apex. It is less compressed at base so that the depth is hardly greater than width, and the apical part is compressed, instead of depressed, and ends very sharply as seen either from above or in profile. Paramera and siphon practically the same in both species, the paramera being gently arched, ciliate at apex, and about as long as median lobe of tegmen. The siphon is rather short, slender and simple.

China (Koebele, No. 1210), 4 males (holotype and paratypes), in Koebele collection; and the following paratypes: 2 males, 2 females, with same data as above, in U. S. National Museum; 7 specimens from Hongkong and 9 labeled West Australia, probably in error, collected by Geo. Compere, in collection of Citrus Experiment Station. The Koebele specimens are from Hongkong.

### **Illeis koebelei new species (Plate II, Fig. 30)**

Like *cincta* and *confusa* and distinguishable only by the male genitalia. Genitalia more similar to *cincta* than *confusa*, but median lobe of tegmen and paramera both shorter. Median lobe very acicular, compressed, sharp and only very slightly upturned at apex. As seen from the side the lobe at the base is much deeper than thick, but considerably less deep than in *confusa*. As seen from above it appears like a thin line. Paramera rather strongly curved at base and thicker in proportion to their length than in the other two species. Siphon similar except that it is more slender.

Japan (Koebele, No. 1210), 101 specimens (holotype ♂ and paratypes); Formosa (Koebele, No. 1210), 4 paratypes, in Koebele collection; and the following paratypes: 1, Japan (Koebele) in collection of Citrus Experiment Station; 3, Gifu, Japan (Y. Nawa), 2, Japan, in U. S. National Museum; also 13 from Szechwan, China (D. C. Graham) in U. S. National Museum, as follows: 8, Tseo Jia Cho, south of Suifu, 2,000-3,000 ft.; 1, Suifu; 1, Shin Kai Si, Mt. Omei, 4,500 ft.; 1, near Luting Kiao, between Fu Yao Lim Pass and Tatsienly, 5,000-6,000 ft.; 1, west of Yachow, 6,000 ft., and 1, west of Fu Lin, 4,000-8,500 ft.; also 2, Okitsu, Japan (F. Muir), in collection of Hawaiian Sugar Planters' Experiment Station.

### **Illeis luzonica new species**

This seems to be exactly like *amboinensis*, except in the male genitalia, as given in the table on page 61. The paramera are slender, straight, inserted very close together and ciliate at apex. The siphon is slightly more slender than in *amboinensis*. Length, 3.8 mm., width, 3 mm.

Described from 1 ♂ (holotype), Los Baños, Luzon, Philippine Islands, July 1916 (F. N. Williams), and 1 ♀ (paratype), from same locality, March-June, 1925 (Penbernton), in collection of the Hawaiian Sugar Planters' Experiment Station.

One female, Larat (F. Muir) appears to represent another undescribed species near *luzonica* and *amboinensis* but differs in the narrower, more oval form, and in having the pronotum less broad, with the side margins much less convergent anteriorly.

## APPENDIX

TABLE OF GENERA ALLIED TO *HIPPODAMIA* AND *NAEMIA*

Body oval, more convex beneath than usual in *Coccinellinae*, head more exposed, the eyes generally fully exposed, legs longer, the femora generally reaching beyond sides of body, prothorax widest near the middle.

1. Prothorax margined at base..... 2  
Prothorax immarginated at base, or at most only slightly laterad..... 7
2. Abdominal coxal plates entirely obsolete..... 3  
Abdominal coxal plates distinct and forming arc reaching not more than to middle of segment; front basitarsi of male dilated..... 6
3. Mesosternal coxal plates obsolete..... 4  
Mesosternal coxal plates distinct; claws simple..... *Naemia* Mulsant
4. Tarsal claws bifid or with a quadrate basal tooth..... 5  
Tarsal claws simple; elytra vittate..... *Paranaemia* Casey
5. Claws with a quadrate basal tooth; prothorax rather strongly arcuate at base, with the raised marginal line complete..... *Coleomegilla* Timberlake  
Claws bifid, the inner tooth much shorter and stouter than the outer tooth; prothorax subtruncate at base, with the raised marginal line distinct except at middle..... *Eriopsis* Mulsant
6. Claws slender, with a quadrate basal tooth; third antennal joint of male longer than joint on either side, triangularly enlarged toward apex and ciliate on outer margin at apex..... *Ceratomegilla* Crotch  
Claws bifid, the inner tooth nearly as acute as outer tooth but much shorter; third antennal joint of male simple and no longer than following joint..... *Adonia* Mulsant
7. Claws bifid or with a basal quadrate tooth..... 8  
Claws simple ..... 9
8. Claws bifid; mesosternal and abdominal plates obsolete or rudimentary  
*Hippodamia* Chevrolat  
Claws with a basal quadrate tooth; third antennal joint of male about equal to following joint and triangularly enlarged toward apex; front basitarsi of male swollen..... *Semiadalia* Crotch
9. Body oval; side margins of elytra rather broadly reflexed, the epipleura horizontal; elytra maculate ..... *Anisosticta* Chevrolat  
Body extremely elongate; elytra vittate, the side margins narrowly reflexed and the epipleura sloping upward from within..... *Macronaemia* Casey

## ANISOSTICTA CHEVROLAT

*Anisosticta borealis* new species

Differs from *A. bitriangularis* (Say) in having underside of body black, with anterior margin of prosternum narrowly white. Mesepimera black. Metepimera black, or at most very obscurely whitish. Venter entirely black. (In *bitriangularis* the mes- and metepimera and sides of venter are white.) Pronotum black, with narrow lateral and anterior border yellow. The anterior pale border widened at middle and uniting more or less with a median pale line reaching to the center. Basal margin with a semioval pale spot at middle. Elytra with a common black sutural vitta reaching almost to apex and dilated four times, i.e., confluent with spots 3, 6, 8 and 9. Spots 1, 2, 4, 5 and 7 enlarged and confluent to form a broad sinuous vitta, which is sometimes narrowly joined to spot 9. Spot 7 sometimes free. Spot 3 sometimes joined to 1, and 6 to 4, thus isolating two pale areas.

1 male (holotype), Nulato, Alaska, June 14, 1916 (Harrington), and 2 paratypes, Anchorage, Alaska, June 6, 1917 (J. S. Hine), in U. S. National Museum.

## NAEMIA MULSANT

### **Naemia seriata seriata** (Melsheimer)

Specimens of this species in the U. S. National Museum are from "Mass."; Staten Island, N. Y., Long Island, N. Y.; "N. J." Cape May, N. J.; Chesapeake Beach, Piney Point, Breton Bay, etc., Md.; Fort Monroe, Old Point Comfort, Wachapreague and Ragged Point, near Coles Pt., Va.; Cameron, Riverside and New Orleans, La.; Victoria, Texas on cotton, and Brownsville, Texas. In the American Museum are specimens from Woods Hole, Mass.

### **Naemia seriata decepta** (Blatchley)

In the American Museum from Beaufort, S. C., and the following places in Florida: Everglade, Kissimmee, Sanford and Dunedin. From Cuba: San Carlos Est., Guantanamo, Cubanias; and from Sources Puentes, Haiti. In the U. S. National Museum from Biscayne, Capron, Pta. Gorda, Paradise Key, Fla. and St. Marc and Etang Sumetre, Haiti.

The Cuban and Haitian specimens, especially the latter, average somewhat larger than typical *seriata* and are brighter colored than Florida specimens of *decepta*, with which they agree in the reduced markings.

## COLEOMEGILLA TIMBERLAKE

### TABLE OF THE RACES AND VARIETIES OF *C. MACULATA* (DE GEER)

1. Head weakly punctured (northern Mexico and northward).....	2
Head distinctly and unequally punctured (Mexico, South America, and West Indies).....	4
2. Spots 2 and 3 united to form a large oval black mark, usually about equally distant from suture and side margin; spot 5 nearly always united with fellow on suture; spot 6 not touching suture even when enlarged; pronotal marks large, obtriangular, rarely confluent at their middle.....	3
Spot 2 usually free, forming a smutting detached black dot near side margin, or altogether absent, spot 3 oval, rather small and widely separated from spots 1 and $\frac{1}{2}$ ; spots 4, 5 and 6 reduced, subequal, but sometimes one or another one-half as large as others, 5 free from suture; pronotal marks reduced, oval, or more or less curvilinear, and generally reaching about three-fourths from base. <i>fusculabris</i> (Mulsant)	
3. Median lobe of tegmen (male genitalia) slender, with a narrow truncate apex which is hardly notched.....	<i>lengi</i> Timberlake
Median lobe of tegmen somewhat broader, more fusiform, the apex a little wider and distinctly notched .....	<i>strenua</i> (Casey)
4. Pronotal marks normally separated by a pale narrow median line or confluent only at the middle.....	5
Pronotal marks united, emarginate in front medially and broadly separated from anterior margin by a pale border and more narrowly separated from the side margins; elytral markings similar to <i>fusculabris</i> , except that spot 2 is sometimes partially or even entirely separated from 3, and spots 4, 5 and 6 are subequal, moderately large, with both 5 and 6 usually united with their fellow on suture.....	<i>cubensis</i> (Casey)
5. Elytral spot 6 free from suture, the markings similar to those of <i>fusculabris</i> , except that mark 2 + 3 is more irregular, with separation of 2 more or less, rarely entirely, complete .....	6
Elytral spot 6 joined with its fellow on suture.....	9
6. Legs black, size and markings similar to <i>lengi</i> , the pronotal marks sometimes reduced <del>as in <i>fusculabris</i></del> .....	7
Tibiae mainly reddish brown; pronotal marks bifurcate, the outer spur slender; spot	

- 2 of elytra longitudinally lengthened and nearly separated from 3, which is large and quadrate; spot 5 narrowly separated from suture; size very large (8 mm.)  
*tibialis* n. var. or subsp.
7. Spot 5 uniting with fellow on suture..... 8  
 Spot 5, as well as 6, free from suture, as in *fuscilabris*..... *bis-sex-punctata* (Latreille)
8. Markings agreeing closely with *lengi* and *strenua*, but head distinctly punctured, male genitalia much like *strenua*..... *medialis* (Casey)  
 Agreeing with *medialis* but elytral markings much heavier, the black spots large, more or less narrowly separated one from the other..... *limensis* (Philippi & Philippi)
9. Mark 2 + 3 reaching to side margin of elytra..... 10  
 Mark 2 + 3 free from side margins of elytra, and about as in *lengi*; spots 1, 4, 5 and 6 large, 5 and 6 being united with fellows on suture; pronotal marks nearly evenly obtiangular and narrowly separated from front margin..... *boliviensis* n. subsp.
10. Similar to *boliviensis* except mark 2 + 3 reaches to side margin and pronotal marks a little larger, more narrowly separated from each other and sometimes confluent at the middle; venter entirely black, or obscurely pale at sides of segments 3 to 5  
*maculata* (De Geer)  
 Similar to *maculata* except that the suture is narrowly black between spots  $\frac{1}{2}$  and 5 and more broadly black between 5 and 6; mark 3 triangular, with one angle directed backward between 4 and 5; 2 joined with 3 but not very broadly; pronotal marks obtiangular and bifid, both arms being short, blunt, subequal; venter entirely dark..... *maculata*, var. *triangulifera*, n. var.  
 Similar to *maculata*, but elytral marks confluent; spot 1 nubilously joined to 2 + 3, latter continuous from suture to side margin and dilated at the middle behind to unite with 4; 4 narrowly joined to 5; suture continuously black from base to spot 6..... *maculata*, var. *confusa*, n. var.

### *Coleomegilla maculata fuscilabris* Mulsant

*Megilla maculata floridana* Leng.

In the American Museum represented by specimens from Key West, Lakeland, Sanford, Royal Palm Park, and La Belle, Florida. In the U. S. National Museum from Paradise Key, Coral Gables, Gainesville, Moore Haven, Enterprise, Orlando, Capron and Lake Poinsett, Florida, and New Orleans, Covington and Mandeville, Louisiana. The type locality is New Orleans.

A series in the National Museum from Shaw Pond and Eastern Branch, Washington, D. C. (H. S. Barber) shows intergradation with *lengi*, but ranges closer to *fuscilabris*. The markings are larger than in typical *fuscilabris*, with spot 5 sometimes joined with fellow on suture. Spot 2 present and usually confluent with 3. In typical *fuscilabris* spots 5 and 6 are always small, generally smaller than 4 and either one or both may be absent. Washington, D. C., is further north than we would expect the influence of *fuscilabris* to show, and Mr. Barber suggested to me that possibly specimens had been introduced on water plants from Florida.

### *Coleomegilla maculata lengi* Timberlake

This race is generally distributed east of the Rocky Mountains. The type locality is Columbus, Ohio. Specimens of *Coleomegilla* from Arizona and southern California (Imperial Valley and San Diego) are presumably referable to *strenua*.

### *Coleomegilla maculata strenua* (Casey)

In the National Museum are specimens from Camargo, El Molina, Los Mochis, Rosario, Eldorado, Tuxpan and San Jose de Guaymas, Mexico. In the American Museum is a specimen from Paso del Norte, Chihuahua. The type locality is Brownsville, Texas.

The specimen from Paso del Norte has markings as in *strenua*, but head is strongly punctured. Two specimens from Rosario, Sinaloa, have the markings nearly as in *strenua* and the head rather strongly punctured. Three specimens from Tuxpan have marking more as in *medialis* and head rather strongly punctured. The Tuxpan specimens are perhaps better referred to *medialis*.

#### **Coleomegilla maculata medialis (Casey)**

This seems to be the *Coccinella oblonga* Olivier, 1791, but that name is preoccupied.

In the American Museum are specimens from Jalapa and Mazatlan, Mexico. In the National Museum it is represented by specimens from San Juan Bautista, Tabasco; Oaxaca; St. Lucrecia, Vera Cruz; and Colima, Mexico; Dueñas and Paso Antonio, Guatemala; Honduras (type, in Casey collection); Gatun, La Chorrera, Tabernilla, Lion Hill, Ancon, Summit (Canal Zone), Chagres River, Juan Mina, Chilibre River, one mile above Juan Mina, etc., Panama; Medellin, Colombia; Caracas and San Carlos Cojedes, Venezuela; Coroní River, Trinidad; and Martinique.

In one out of six specimens from San Carlos Cojedes (H. P. Pittier) spot 2 reaches the side margin, thus agreeing with *maculata* (De Geer), but the pronotal black mark is very large, entire, leaving only the side margins and outer portion of anterior margin on each side, narrowly pale. The others agree closely with *medialis*. In one out of three specimens from Coroní River, Trinidad (Harold Morrison), spot 2 reaches rather obscurely to the side margins.

#### **Coleomegilla maculata bis-sex-punctata Latreille**

As recognized by me this agrees with *medialis* except that spot 5 is reduced in size and separated from suture. It is questionable whether the specimens seen by me represent a race or a mere variation of *medialis*.

It is represented by two specimens from Panajachel, 5,000 ft., Guatemala (Champion), in the American Museum.

#### **Coleomegilla maculata tibialis new subspecies**

Differs from other races in having tibiae distinctly brown, the hind pair only distinctly so on the outer (dorsal) margin. Head strongly punctured. Pronotal marks strongly obtriangular and bifid in front, with outer spur slender, the inner one shorter and truncate. The two marks well separated medially, broadly behind and one-half closer on anterior half. They are broadly separated from anterior and lateral margins. Elytral marks 1 and  $\frac{1}{2}$  large but well separated from each other and from 2 + 3. Mark 2 + 3 almost divided by a thin obscure pale line, the component 2 being elongate and longitudinally disposed. 3 large and quadrate, forming a deep acute angle in the pale ground color where it joins with 2 behind, and acutely produced along 2 on its other side. 2 free from the side margin. Spot 4 rather large and round. 5 smaller than 4 and reaching close to but not quite touching suture. Spot 6 about one-half as large as 5 and free from suture. Length, about 8 mm.

Described from 1 male (holotype), Rio Frio, Colombia, Mar. 1924 (H. W. Atkinson), in U. S. National Museum.

#### **Coleomegilla maculata limensis (Philippi & Philippi)**

This as recognized by me agrees closely with *medialis* but has the elytral markings much heavier.

Pronotal marks obtriangular, slightly emarginate at apex, well separated medially, and reaching to apical fifth. Elytral marks all large, but 2 not reaching side

margins and 6 not confluent with fellow at suture. Mark 2 + 3 emarginate on each side where the two components are fused, 3 being much the larger, extending angularly forward between spots 1 and  $\frac{1}{2}$  and behind approaching in a broad curve to spot 4 or even slightly confluent with 4. Head strongly punctured.

5 specimens from Peru, without further data, in the American Museum.

3 specimens from Milagro, Ecuador, Nov. 29, 1922 (F. X. Williams), in H.S.P.A. collection, agree closely with the Peruvian specimens. In two of these mark 2 + 3 is irregularly crescent-shaped, with inner horn very much longer than the outer part. In the other specimen mark 2 + 3 is truncate in front, spot 1 prolonged behind and nebulously confluent with 2 + 3, which is distinctly confluent with 5.

#### **Coleomegilla maculata boliviensis new subspecies, or var.**

This as described in the table does not differ much from *maculata* (De Geer) except that mark 2 + 3 is comparatively small and fails to reach the side margin.

Described from 1 specimen (holotype) from Rurrenabaque, Rio Beni, Bolivia, Jan. (W. M. Mann), in U. S. National Museum.

#### **Coleomegilla maculata maculata (De Geer)**

Pronotal marks large, narrowly separated medially, sometimes a little coalescent at middle, and narrowly separated from anterior and lateral margins. Elytral markings heavy, but normally showing little if any coalescence. Mark 2 + 3 completely fused and extending to the side margins. Spot 6 fused with fellow on suture. Head strongly punctured.

In U. S. National Museum represented by specimens from Pernambuco, Jan. and Feb. 1883 (Koebele), Manaos (Miss H. B. Merrill) and Obidos (H. Rolle), Brazil; Paramaribo, Dutch Guiana (D. F. Fernandez); Ciudad Bolivar, Venezuela, 100 ft., Nov.-Dec. 1929 (Ernest Holt); and Barbados. In American Museum, 5 from Brazil without further data, 2 from Obidos (H. Rolle) and 13 from Barbados.

The Barbados specimens show a strong tendency toward coalescence of the pronotal marks, which are sometimes completely joined as in *cubensis* (Casey), but they are much larger than in that race and reach nearly to anterior margin. In one specimen mark 2 + 3 does not quite reach to the side margin. The variation of the Barbados specimens is in the direction of *cubensis*, but they are clearly referable to *maculata*.

The Obidos specimens are unusually large (about 7.25 to 7.8 mm.) and have the pronotal marks smaller than usual, obtriangular, slightly emarginate anteriorly and well separated medially. Elytral marks normal for *maculata*.

#### **Coleomegilla maculata maculata var. *confluens* new variety**

One out of six specimens from Obidos is smaller than the others and has the black markings of elytra confluent.

Pronotal marks about the same as in the other Obidos specimens described above. Suture of elytra broadly margined with black from base to spot 6 so that the usual four sutural marks are distinctly joined. Spot 1 nubilously connected with 2 + 3. Mark 2 + 3 continuous and nearly even from side margin to suture, except at the middle behind it is triangularly dilated and extends back to join broadly with 4. Spot 4 narrowly confluent with 5. Spot 6 forming with fellow a transverse band that crosses the suture and reaches almost to side margins. By this coalescence a pale mark shaped like half an hour-glass is isolated at the base, and behind the middle an oblique pale streak is fully enclosed.

Described from one specimen (holotype) from Obidos, Amazonas, Brazil (H. Rolle), in Casey collection, U. S. National Museum.

**Coleomegilla maculata maculata var. triangulifera new variety**

Differs from typical *maculata* in its rather smaller size, smaller pronotal marks and peculiar shape of the elytral marks.

Prothorax pale yellowish or whitish, distinctly paler than the flesh colored elytra. Pronotal marks obtriangular, distinctly emarginate in front, well separated from anterior and lateral margins, and broadly separated from each other behind but coming close together in front. Mark  $\frac{1}{2}$  of elytra large and lozenge-shaped, the suture behind it to mark 5 + 5 being obscurely blackened. Spot 1 large but well separated from the others. Of mark 2 + 3 the component 2 is relatively small and transversely lengthened to side margin. Component 3 large, triangular, transverse in front and angularly extended behind between 4 and 5. Spot 4 large and narrowly separated from 5. Spot 5 large and broadly confluent at suture with fellow. Spot 6 transverse and reaching to suture where it joins with fellow. Marks 5 + 5 and 6 + 6 distinctly joined by a black sutural line. Length, about 5 mm.

Described from 2 specimens (holotype and paratype) Ciudad Bolivar, Venezuela, 100 ft., Nov.-Dec. 1929 (Ernest Holt), in U. S. National Museum.

Another specimen with the same data is a typical *maculata*.

**Coleomegilla maculata cubensis (Casey)**

Pronotal marks consolidated, broadly separated from anterior and lateral margins and strongly emarginate in front medially. Elytral marks medium in size, 1, 2 + 3, 4 and 6 well separated from each other. Component 2 sometimes separated from 3, or partially separated, or the two fused to form an oval mark, never reaching to side margin. Spot 5 and 6 fused more or less at suture with fellow. Mark 5 + 5, 6 + 6 and 4 about equal in size. Head strongly punctured.

Represented in National Museum by specimens from Cayamas, Santiago de las Vegas, Jobabo, Manati and Baragua, Cuba; Haiti and Camp Perrin, Haiti; and near San Pedro de Macoris, Dominican Republic. In American Museum from near Havana, 24 K. north of Viñales and 12.5 K. south of Pinar del Rio, Cuba; and La Morimiére, Haiti.

The related *Coleomegilla innotata* (Mulsant) is known from Puerto Rico. This is hardly more than an insular race of *maculata*.

### HIPPODAMIA CHEVROLAT

#### TABLE OF AMERICAN SPECIES OF THE 13-PUNCTATA GROUP, BASED ON MALE GENITALIA

1. Median lobe of tegmen with a rod-like, well-chitinized sublamine process on each side from lateral margin of ventral wall..... 2
- Median lobe of tegmen shorter, slightly tapering from base to beginning of the last third, where it is abruptly bent downward and rapidly tapers to acute apex, process from ventral wall on each side membranous, broad, thinly laminate and with a short acute apical point, ventral plates of the lobe ending apically in recurved rather slender points which cross each other and project on each side close to apex of lobe; paramera rather short, broad, ciliate on dorsal margin to the middle; siphon bent almost double near end of basal third, the part beyond abruptly and considerably thickened, becoming more compressed and dilated into a large triangular lobe on upper margin near beginning of apical third, the part beyond the dilation slender

*americana* Crotch

- 1 ♂, White Fish Point, Lake Superior (Hubbard & Schwarz)
2. Process on each side of median lobe of tegmen long and slender, ending opposite the

beginning of the last fifth of the lobe, and slightly hooked on outer side at apex; basal third of dorsal surface of median lobe with a triangular crest, with almost vertical side walls; lobe bent downward just beyond apex of triangular crest at angle of about  $45^{\circ}$ , slightly expanding in its apical fourth with the dorsal surface concave; apex of the lobe rounded, with a small blunt median point; paramera rather long and broad, but narrowed toward base, the apex with a thin membranous margin; siphon abruptly bent near end of basal third, the part beyond slightly and fusiformly swollen, armed with a very small membranous lobe near beginning of the last eighth, the apical eighth slender.....*falcigera* Crotch

1 ♂, Hudson Bay (Hubbard & Schwarz collection)

Process on each side of median lobe vertically laminate, finger-like, ending opposite beginning of apical third of the lobe; dorsal side of lobe with a very small triangular raised area at base, subdepressed beyond and abruptly bent downward at an angle of  $45^{\circ}$  a little beyond the middle; paramera broad and moderately long, narrowed only at extreme base; siphon bent almost double near end of second fifth of the length, much as in *falcigera* but less swollen in middle portion, and with the dorsal dilation near apex larger.....*tibialis* (Say)

### COCCINELLINA TIMBERLAKE

#### TABLE OF NEOTROPICAL SPECIES FORMERLY INCLUDED IN *COCCINELLA*

1. Elytra immaculate flavous or reddish.....	2
Elytra marked with black.....	4
2. Disk of pronotum black, with a white spot on each side.....	3
Disk of pronotum black, broadly bordered in front and on sides with yellowish white; anterior margin of black area of pronotum transverse in female, indented on each side in male; elytra red or tawny; mesepimera white; legs black; length, 5.2 mm.	
<i>fulvipennis</i> (Mulsant)	
3. Pronotum bordered on sides and in front with white, the border narrow and nearly uniform in width throughout; elytra reddish yellow or flavous; mes- and metepimera white; length, 4 mm.....	
<i>emarginata</i> (Mulsant)	
White border of pronotum extremely narrow in front, distinctly notching the black medially, and much broader on the sides but constricted just behind the middle by a blunt extension of the black area; mesepimera white; length, 3.3 to 4.8 mm.	
<i>ecuadorica</i> n. sp.	
4. Pronotum with a pair of discal spots.....	5
Disk of pronotum black, without discal spots.....	7
5. Black marks of elytra not confluent with sutural vitta.....	6
Black marks of elytra confluent with sutural vitta and dividing the surface into five pale areas: two basal, two median, and one apical; discal spots of pronotum elongate; pronotum margined with yellow in front and more broadly on sides; length, 4.5 mm.	
<i>pictitii</i> (Mulsant)	
6. Black sutural vitta dilated at the beginning of the first third and again angularly near apex; elytra each with two black discal marks, one on the callus, the other at two-thirds; length, 3.9 mm.....	
<i>lucasi</i> (Mulsant)	
Black sutural vitta angularly dilated a little behind the scutellum and near the apex, and curvilinearly contracted at the middle; elytra each with two large black marks, longitudinally disposed on disk and often confluent; length, 3.9 mm.	
<i>ancoralis</i> (German)	
7. Elytra red or yellowish red, with three rounded yellowish white spots enclosed in a black circle; pronotum broadly yellowish white on each side, but the pale border constricted before the middle by a lateral extension of the black area; length, 4.5 mm.	
<i>pulchella</i> (Mulsant)	
Elytra not thus marked.....	8
8. Each elytron pale around the periphery.....	9

Elytra with sutural margin and two transverse bands, black; first band broad, curving forward to callus, with a lateral spur directed backward, the hind margin of the band slightly behind the middle; second band strongly oblique and subapical, also with a backward-directed spur on its outer margin; pronotum black, with anterior margin narrowly pale, and lateral margins a little more broadly so; length, 4 mm.

*shannoni* n. sp.

9. Elytra each with two black marks or abbreviated bands, more or less distinctly contracted toward outer and sometimes confluent on inner side.....*eryngii* (Mulsant)  
 Elytra black, but flavous around the entire periphery of each and marked with four somewhat rounded spots, one next to the scutellum, two a little before the middle and one subapical.....*areata* (Mulsant)

#### **Coccinellina emarginata** (Mulsant)

In the U. S. National Museum this species is represented by specimens from Mexico as follows: Dist. Fed. (J. R. Inda, R. Miller, J. Conradt); Mexico City (O. W. Barrett); Digna (A. L. Herrera); Jalapa (J. T. Mason); Tlapam (R. H. Hay); Aguas Calientes (E. A. Schwarz); Sierra de la Ajudoso (R. H. Hay); Tacuba, on beans (H. F. Wickham); Cuernavaca (E. G. Smythe); Cordoba (F. Knab); Amula, Guerrero, 6,000 ft. (H. H. Smith). From Nicaragua: Managua (A. D. Harvey); San Marcos (Baker). From Costa Rica: San José (M. Valeris); Zarzero (Schild & Burgdorf); Tilaran, Guanacaste, 550 M. alt. (P. C. Standley). Also from Tegucigalpa, Honduras (F. J. Dyer); Merida, Venezuela (S. Bricano); and Campa Santos de Salto, Argentina, in citrus grove (M. Kisliuk). In collection of the H.S.P.A. Experiment Station are specimens collected by F. X. Williams at Mera and Baños, Ecuador.

The Argentine specimen is a little larger than usual, but not separable on the basis of a single specimen.

#### **Coccinellina ecuadorica** new species (Plate II, Fig. 31)

Similar to *C. emarginata* (Mulsant) but pronotum unequally bordered in front and on sides with white, and only the mesepimera, white. The male genitalia are distinctive. Median lobe of tegmen subdepressed, slightly convex above, about two and one-half times longer than wide, widest close to the base, then tapering slightly to beginning of apical third, beyond which it is a little expanded and strongly curved upward. Apex obliquely truncate on each side, so that the margins meet in an angle of 90°, but angle a little rounded off. On dorsal surface on each side before the upturned part is a long line of hairs. Paramera straight, nearly as long as median lobe, moderately broad, rounded at apex and ciliate on each margin. Sipho short, rather stout, and abruptly contracted close to apex into a short slender portion. In *C. emarginata* the median lobe of tegmen is not so broad, regularly tapering from base to apex to form the outline of a very acute-angled triangle. Apical third upturned. Dorsal surface of basal part strongly teetiform, but the ridge narrowly creased in median line. At apex of teetiform part is a pencil, or short line, of hairs submedianly on each side. Paramera and sipho considerably slenderer than in *ecuadorica*, but otherwise not much different.

1 male, 2 females (holotype ♂, allotype and paratype), Huigra, Ecuador, 4000 ft. (F. X. Williams), in collection of Hawaiian Sugar Planters' Experiment Station; and 2 males (paratypes), Cariamanga, Ecuador, on cotton (C. H. T. Townsend), in U. S. National Museum.

#### **Coccinellina shannoni** new species

Suggestive of *C. petitii* (Mulsant), and possibly only a variety of that species, but lack of discal spots on pronotum is probably distinctive. Other characters as given in table.

1 female (holotype), Matucana, Peru (R. C. Shannon), in U. S. National Museum.

### PSEUDADONIA NEW GENUS

In general form and shape of the head, prothorax and elytra this agrees closely with *Coccinella*, having a broader form than in *Semiadalia*. In some respects it agrees with *Semiadalia*, as in the immarginated base of pronotum, dilated tarsi and structure of claws, but differs in having the abdominal plates incomplete, the third antennal joint simple, pronotum more convex and wider behind the middle, mesosternum much more depressed, etc.

Claws moderately long, with a basal quadrate tooth. Legs hardly elongate, the tarsi distinctly shorter than tibiae. First two joints of front and middle tarsi dilated in male, but rather less broadly than in other genera showing this character. Antennae with joints 3 to 8 slender, cylindrical, the third about four times longer than thick and not dilated at apex as in *Semiadalia* and *Ceratomegilla*. Club rather elongate, enlarging from the base of ninth joint to the obliquely truncate apex of the eleventh. Sternal and abdominal plates well developed, the latter incomplete, with the line curving outward very close to the hind margin of the segment and without oblique line. Mesosternum depressed, truncate in front with a raised margin. Middle coxae rather narrowly separated, the metasternal process narrowly rounded between them. Prothorax rather strongly convex, widest behind the middle, arcuate behind and not at all margined at base. Head well exposed. Form rather broadly oval, the elytra each hardly more than twice longer than wide. Epipleura of elytra horizontal and of ordinary width.

Genotype: *Pseudadonia chiliana* n. sp.

#### *Pseudadonia chiliana* new species

Male—Head, under surface of body and base of pronotum black. Face with a broad transverse white band between the eyes. Mesepimera and epipleura of prothorax white. Pronotum broadly white in front and at sides, the pale color reaching to middle in median line. Black basal area of pronotum strongly trilobed at apex, the two lateral lobes moderately wide, somewhat tapering and directed slightly obliquely outward as well as forward, the median lobe much broader, rounded at apex but with a rather deep notch in the middle. At apex of the lateral lobes on each side there is an extension of the black color straight outward, which reaches half way across the white border (and which may possibly form a detached spot in some specimens). Scutellum black. Elytra fulvous, unmarked. Labrum black. Slender intermediate joints of antennae pallid, but the base and club blackish. Outer margin of mandibles, whitish. Length, about 4.9 mm., width, about 3.8 mm.

The genitalia show no particular close alliance to *Coccinella* or any of the genera with enlarged tarsal joints. Paramera broad, only a little shorter than median lobe of tegmen, about twice as long as wide, with outer margin straight, inner margin arcuate and ciliate from apex to the middle. Median lobe depressed, rather broad, about three times as long as wide and ogivally rounded at apex. Sipho moderately long, abruptly but not strongly bent at the beginning of the last third, which is cylindrical, moderately tenuous and hardly tapering except very close to apex.

Described from 1 male (holotype) from southern Chile (M. J. Rivera), in U. S. National Museum.

#### TABLE OF AMERICAN GENERA OF COCCINELLINAE WITH METACOXAL PLATE INCOMPLETE

1. Epipleura of elytra horizontal and never much expanded.....	2
Epipleura more or less inclined and descending externally or very broad.....	6
2. Mesosternum depressed and truncate in front.....	3
Mesosternum either convex or emarginate medially in front.....	5
3. Metacoxal plate without an oblique line.....	4
Metacoxal plate divided by an oblique line, which is very distinct and meets the bounding line very close to hind margin of segment; antennae short, the apical joint as long as wide; elytral punctures generally very fine and equal; form oval, or moderately elongate oval, and convex; pronotum always black with anterior corners and sometimes anterior border, pale.....	<i>Coccinella</i> Linnæus

4. Front and middle tarsi of male simple; form oval, moderately convex, elytral punctures very fine and equal; mcsosternum sometimes slightly sinuate medially in front; pronotum black, with a narrow pale border in front and on sides and sometimes with two discal spots..... *Coccinellina* Timberlake
- Front and middle tarsi of male dilated; form rather broadly oval, convex; mesosternum truncate in front, with a raised margin; black area of pronotum strongly trilobed ..... *Pseudadonia* Timberlake
5. Mesosternum strongly emarginate medially; prosternal process broad and bicarinate, the carinae reaching forward to middle of segment; epipleura about as wide as space between middle coxae, which are rather broadly separated; metacoxal plate without an oblique line, antennae elongate, the apical joint much longer than wide, squarely truncate at apex; elytra with fine and strong punctures interspersed; form broadly oval and convex..... *Anisocalvia* Crotch
- Mesosternum convex and slightly sinuate medially in front; prosternal process slender and not carinate; epipleura more or less evidently furrowed, distinctly wider than space between middle coxae, which are close together; antennae elongate, the apical joint about as long as wide, longer than penultimate joint and slightly obliquely truncate at apex; elytral punctures more or less coarse, or if finer on the disk, having those on outer margin coarser; form more or less broadly oval and sub-depressed..... *Mulsantina* Weise (*Pseudocleis* Casey)
6. Epipleura of elytra very wide, obviously exceeding width of space between outer margin of middle coxal cavity to outer margin of sternum; elytra with a broad explanate margin ..... 7
- Epipleura moderately wide, not or hardly exceeding width of space from middle coxal cavity to outer margin of sternum.....
7. Elytra immargined on outer border; epipleura squalling or exceeding one-half the width of whole sternum and strongly descending externally, mesosternum somewhat emarginate in front medially; intercoxal process of first ventrite subtruncate at apex; oblique line of metacoxal plate subobsolete; large and orbicular, the elytra with a very wide explanate margin..... *Mononeda* Crotch
- Outer border of elytra with a more or less evident raised margin; epipleura and explanate margin of elytra often not so greatly widened as in *Mononeda*; intercoxal process of first ventrite rounded at apex; oblique line of metacoxal plate either distinct or nearly obsolete; otherwise much like *Mononeda*..... *Neda* Mulsant
8. Scutellum depressed, level with surface of elytra..... 9
- Scutellum distinctly elevated above surface of elytra and declivous in front; antennae abruptly widened at the ninth joint, the first two joints of club produced into a tooth on inner side, the apical joint about as long as wide and produced into a broad truncate joint on inner margin; mcsosternum rather convex and emarginate medially in front; prosternal process expanding behind the coxal cavities; epipleura of elytra widest at end of first third, then gradually tapering to an acute point behind; callus of elytra very prominent..... *Pelina* Mulsant
9. Mesosternum convex; elytral punctures rather strong and close..... 10
- Mesosternum at most weakly convex between and just in front of middle coxae..... 11
10. Mesosternum with a small obtuse emargination in front medially; prosternal process carinate on each side; oblique line of metacoxal plate meeting the bounding line very obliquely, so that the outer angle is very acute; elytral punctures moderately strong and unequal; last two antennal joints wider than long, the apical one truncate at apex..... *Neoharmonia* Crotch
- Mesosternum truncate in front, or with a mere trace of an emargination medially; metacoxal plate without an oblique line; apical joint of antenna quadrate, as long as wide, truncate at apex..... *Harmoniaspis* Casey
11. Prothoracic epipleura not foveate; antennae with club well developed..... 12
- Prothoracic epipleura with a rounded depression on inner side anteriorly; antennae short, slender, gradually and only slightly increasing in thickness beyond the middle; the apical joint longer than wide and rounded at apex; mesosternum with a deep triangular emargination in front; metacoxal plate attaining hind margin

- of segment; epipleura of elytra descending externally and slightly foveate to receive hind femora.....*Coelophora* Mulsant\*
12. Frons rather more than twice as wide as diameter of eye; eyes finely faceted, the inner orbits parallel ..... 13  
 Frons less than twice as wide as diameter of eye; eyes more coarsely faceted, with inner orbits more or less convergent behind ..... 14
13. Mesosternum truncate in front, or at most slightly sinuate in middle; oblique line of metacoxal plate obsolete; form rounded, very convex; pronotum black, the anterior and lateral margins and two discal spots (often confluent with pale margin), white; elytra immaculate ..... *Cycloneda* Crotch  
 Mesosternum rather strongly but obtusely emarginate; oblique line of metacoxal plate frequently distinct but incomplete; elytra finely or moderately strongly punctured, form broadly oval to orbicular, rather less convex than in *Cycloneda*; pronotum pale with seven black spots forming an M (the mediobasal spot sometimes absent), or in melanic form black with sides broadly pale; elytra maculated, or in melanic form black with a pale mark before the middle ..... *Olla* Casey
14. Frons distinctly exceeding diameter of eye, but less than twice as wide ..... 15  
 Frons no wider than diameter of eye, eyes a little more coarsely faceted than in *Paraneda*; antennae moderately long; claws small, hardly longer than basal quadrate tooth; prosternal carinae reaching nearly to anterior margin of segment; mesosternum less distinctly emarginate in front medially than in *Paraneda*  
*Erythroneda* new genus

Type, *Daulis rubida* Mulsant

15. Elytra coarsely punctured, dark brassy green; pronotum red becoming somewhat paler on each side; claws short, no longer than basal tooth; frons nearly twice as wide as diameter of eye; mesosternum with a small obtuse emargination in front and a small fovea on the declivous front edge; oblique line of metacoxal plate incomplete ..... *Chloroneda* new genus

Type, *Cycloneda metallica* Crotch

- Elytral punctures very fine; claws large, much longer than basal quadrate tooth; mesosternum slightly emarginate in front and foveate on the declivous edge; frons posteriorly about one and one-half times wider than diameter of eye; elytra immaculate; pronotum pale at sides, darker in middle, the dividing line between the two areas strongly arcuate and black ..... *Paraneda* Timberlake

Type, *P. viridescens* Timberlake

#### KEY TO COELOPHORINE GENERA, BASED ON MALE GENITALIA

1. Sipho simple, or at most a little swollen between the middle and beginning of the last third ..... 2  
 Sipho strongly swollen at or beyond the middle and armed with a pair of retrorse hooks or triangular membranous processes, originating near apex of the swelling from the ventral wall; or sometimes only slightly swollen but having the lateral margins crenulated before the ventral processes ..... 11
2. Sipho of ordinary length ..... 3  
 Sipho extremely long and slender, somewhat tapering in apical part, the apex being moderately tenuous; median lobe of tegmen compressed, strongly so at its upturned apex; its dorsal surface narrow, with a low median crest on the basal fifth, its apex in side view subtruncate and somewhat resembling the prow of a canoe; paramera almost contiguous at base, moderately armed, somewhat clavately enlarged at apex ..... *Heterocaria* new genus  
 Type, *H. papuana* n. sp. (Laloki, Papua, F. Muir)
3. Median lobe of tegmen more or less emarginate at apex ..... 4  
 Median lobe of tegmen acute or truncate at apex, never emarginate ..... 5

\* *Coelophora* is not American, but in the U. S. National Museum is a specimen from Central America, and the record is apparently authentic. The species as I remember, is *C. inaequalis* var. *g-maculata* (Fab.). It must have been introduced through commerce.

4. Median lobe depressed, only slightly longer than wide, deeply emarginate at apex, and acutely angled on each side of the emargination (form resembling an old-fashioned bootjack and recalling that of *Synharmonia*, but the lobe much shorter, not turned upward at apex and much more deeply emarginate); paramera short and straight, as long as median lobe and well separated at base; siphon short, moderately stout, and having the apical tenth rather abruptly tapering to a fine membranous point  
 Type, *Coclophora guttata* Blackburn *Gyrocaria* Timberlake  
 Median lobe about three times as long as wide, with a small notch at apex and the apex conspicuously turned upward; paramera similar being short and straight, but much more evenly rounded at apex; siphon similar, but abruptly narrowed, its apical fifth being very slender and tapering to an exceedingly tenuous point. *Oenopia* Mulsant  
 Type, *O. cinctella* Mulsant
5. Siphon stout, with the two dorsal strands conspicuously twisted one over the other near apex ..... 6  
 Siphon slender, at least toward apex, so that the twist in the dorsal strands, although present, is not at all conspicuous ..... 8
6. Siphon without a constriction, the extreme apex more or less membranous (sometimes expanding) between the two pairs of chitinized rods ..... 7  
 Siphon constricted at the twist in the dorsal strands, the part beyond being rather long, abruptly bent downward and then abruptly recurved in a sharp S-shaped fashion; portion of siphon basad of the twist broad and depressed nearly to the base; median lobe of tegmen depressed, nearly four times as long as wide, and arcuately tapering to the acute, somewhat upturned apex; paramera as long as median lobe, arched toward base and inserted moderately far apart ..... *Synia* Mulsant  
 Type, *S. melanaria* Mulsant
7. Median lobe of tegmen elongate, but not narrow (a little more than four times as long as wide), tapering in the apical fourth, and with an abruptly and strongly upturned point, which is truncated at apex; ventral walls of median lobe meeting in the median line, but leaving a large oval opening for passage of siphon just before the upturned apex; paramera rather stout, as long as median lobe, almost straight and cirrate on both margins nearly to the middle ..... *Caria* Mulsant  
 Type, *C. dilatata* (Fabricius)  
 Median lobe narrow, elongate (about five times as long as wide), tapering to an acute point at apex which is just perceptibly and very briefly upturned; dorsal surface of median lobe with a carinate median crest on middle third of length and somewhat furrowed on each side of the crest, the two furrows uniting at basal end of crest and proceeding to the base; under surface of median lobe crested on apical third, the siphon issuing basad of this crest; paramera much as in *Caria*, but slightly arched and cirrate on inner margin only at apex and on outer side nearly to the base ..... *Cyphocaria* Crotch  
 Type, *C. duvaucelii* (Mulsant)
8. Ventral wall of siphon not swollen between the middle and beginning of the apical third; median lobe of tegmen depressed ..... 9  
 Ventral wall of siphon having the membranous part bulged out between the middle and beginning of the apical third; median lobe of tegmen rather narrow and elongate, tapering triangularly to acute apex and subcompressed (deeper at base than the dorsal width); paramera as long as median lobe, nearly straight, rather slender, and cirrate at apex and on outer side to the middle or a little beyond. *Lemnia* Mulsant  
 Type, *Lemnia saucia* Mulsant
9. Median lobe of tegmen very acute at apex; siphon moderately long and slender ..... 10  
 Median lobe of tegmen about three times as long as wide, parallel-sided, but narrowed near apex, the latter strongly curved upward and truncate; paramera rather stout, nearly straight, not quite as long as median lobe, little thickened at apex and cirrate on apical half and on inner margin nearly to the base; siphon short, moderately slender, abruptly narrowed near apex, and with the extreme apex membranous, slightly expanded and abruptly bent downward ..... *Protocaria* Timberlake  
 Type, *P. scalaris* Timberlake

10. Median lobe of tegmen slender, acicular; paramera slender, arched, fully as long as median lobe and cirrate on both sides of the apical third; siphon moderately long, slender and tapering to a tenuous point at apex..... *Propylea* Mulsant  
 Type, *P. 14-punctata* (Linnaeus)  
 Median lobe of tegmen somewhat more than three times as long as wide, the sides subparallel in basal half, then ogivally narrowed, with a short, slender, upturned process at apex; paramera as long as median lobe, rather slender, strongly arched and cirrate at apex and on apical third of outer margin; siphon much as in *Propylea* but not so tenuous at apex..... *Spilocaria* new genus  
 Type, *Coelophora bissellata* Mulsant
11. Lateral margins of siphon not crenulated before the hooks or membranous processes.. 12  
 Lateral margins of siphon crenulated before the processes by means of one or two pairs of broadly rounded protuberances; processes of siphon membranous, appearing slightly retrorse as seen from above; portion of siphon beyond processes rather elongate and slender, abruptly bent downward at a slight constriction near its middle, the part beyond recurved and tapering to a fine point; the dorsal strands of apical portion of siphon twisted one over the other; median lobe of tegmen large, depressed, four or five times longer than wide, more or less ogivally pointed at apex; under surface of median lobe more or less carinate in median line on apical third, the carina ending basad at a more or less pronounced conical process; paramera slender, more or less curved, reaching to apex of median lobe, and cirrate on outer margin as far as or beyond the middle..... *Coelophora* Mulsant  
 Type, *C. inaequalis* (Fabricius)
12. Median lobe of tegmen depressed, with a broad dorsal surface..... 13  
 Median lobe of tegmen compressed, deep dorso-ventrally at base where it appears constricted in dorsal view, then either gradually tapering toward apex, as seen from side, or abruptly becoming depressed on apical half, with the dorsal surface ovaly expanded in that portion; paramera straight, slender, not enlarged at apex; siphon rather short and stout, cylindrical moderately swollen near beginning of apical third, with the dorsal strands separating at the swelling, and armed beneath with a pair of membranous or more or less chitinized processes; portion of siphon beyond the swelling tapering, slightly constricted close to apex, with the part beyond bent slightly downward, more membranous, but not at all tenuous; dorsal strands of apical portion of siphon inconspicuously twisted..... *Eocaria* Timberlake  
 Type, *E. muiri* Timberlake
13. Median lobe of tegmen large, about three times, or more longer than wide, compressed beneath; siphon with comparatively weak or membranous processes from ventral walls at apex of swelling..... 14  
 Median lobe of tegmen short and broad, not much longer than wide, strongly depressed above and beneath, and ogivally narrowed to a very short projecting point at apex; paramera longer than median lobe, moderately slender, slightly curved and well separated at their bases; siphon rather short, moderately slender, cylindrical, more firmly chitinized than usual, with the separation of the component strands little apparent and with no evident swelling, but provided with a pair of processes near the beginning of the apical third, which are more or less chitinized and sometimes form large and conspicuous retrorse hooks..... *Phrynocaria* Timberlake  
 Type, *Coccinella congener* Schönherr
14. Median lobe of tegmen having a dull, microscopically tessellate, softer area at base of dorsal surface; under surface of lobe with a strong medio-longitudinal crest formed out of two appressed lamina, which separate for passage of siphon, but fuse in apical fourth and as seen from side become obliquely truncate to apex of lobe; paramera approximated at base, strongly curved, somewhat expanded toward apex and having their broader side parallel to surface of median lobe; siphon more or less swollen, with the two dorsal strands distinctly indicated, and having a pair of membranous processes from the ventral strands at the apex of the swelling; portion of siphon beyond ventral processes slender and having an inconspicuous twist in the dorsal strands..... *Bothrocaltiva* Crotch

Type, *B. albolineata* (Schönherr)

Median lobe of tegmen entirely firm and polished above; siphon usually very strongly swollen; paramera more or less approximated at base, but soon spreading apart, their curvature more in a lateral plane instead of in a dorso-ventral direction as in *Bothrocalvia*, so that the flattened inner surface at apex of each is obliquely inclined to dorsal surface of median lobe; the parts otherwise much as in *Bothrocalvia* ..... *Microcaria* Crotch

Type, *M. mulsanti* (Montrouzier)**HETEROCARIA** NEW GENUS

Characters in general those of *Coelophora* Mulsant. Head as in *Coelophora* except that the frons is narrower and not greatly wider than width of eye. Pronotum indistinctly margined on each side. Disk of pronotum shallowly depressed or subfoveate on each side, close to lateral margin. Fovea of thoracic epipleura shallow, but reaching to the middle. Prosternal carinae reaching nearly to anterior margin, somewhat divergent behind, and the apex of the intercoxal process broad and rounded. Mesosternum weakly emarginate in middle of anterior margin, but the declivous anterior surface with a distinct pit to receive the prosternal process. Elytra as in *Coelophora* except that the lateral margins are definitely explanate, the disk somewhat furrowed just within the lateral margins, and the epipleura less strongly descending externally. Elytra with a distinct marginal bead on outer margin from base for about two-thirds of the length. Characters of the genitalia as given in table.

Genotype: *Heterocaria papuana* n. sp.

**Heterocaria papuana** new species (Plate II, Fig. 32)

Form orbicular, strongly convex. Head and pronotum very minutely, weakly punctured. Elytra more evidently punctured, the punctures very fine and rather close, with larger, more or less pellucid punctures interspersed, but these mostly restricted to the submarginal furrow. Head and prothorax testaceous yellow, the front and middle legs concolorous. Basal margin of pronotum narrowly black on middle third, and the lateral margins very narrowly blackish, except anteriorly. Thoracic epipleura with a yellowish white mark behind, this mark extending on to the fovea. Sternum black, but mesepimera yellowish white. Hind legs blackish, except tibiae, tarsi and inner side of femora, which are somewhat more brownish than front and middle legs. Venter dark brown. Scutellum and elytra black, the epipleura with a broad yellowish white streak on basal half. Disk of each elytron with eight testaceous yellow spots in four series: 3, 3, 1, 1. Spots of basal series largest, subequal in size, but differing in shape. Spot 1 oblique, nearly thrice as long as wide, situated between callus and margin. Spot 2 oval, except inner margin is nearly straight and anterior end pointed, placed just inside the callus. Spot 3 nearly circular and almost touching scutellum. Second series about half-way between the base and the middle of the length; the spots extremely unequal. Spot 4 subequal to 1, 2 and 3, transversely subquadrate and placed in the submarginal furrow. Spots 5 and 6 small and inconspicuous, 6 on one elytron being nearly obliterated. Spot 5 about equal distance from suture and lateral margin and distinctly posterior to 4 and 6. Spots 7 and 8 in longitudinal alignment with 1 and 4, the line distinctly diverging from outer margin posteriorly. Spot 7 placed just before the beginning of the last third of the length. Spot 8 subapical, a little closer to the suture than to the outer margin, and somewhat smaller than 7, which is approximately one-half as large as 1, 2, 3 or 4. Length and width, nearly 5 mm.

Described from 1 male (holotype), Laloki, Papua, July, 1909 (F. Muir), in collection of Hawaiian Sugar Planters' Experiment Station.

**SPILOCARIA** NEW GENUS

Form and structure much as in *Coelophora* Mulsant. Frons twice as wide as eye. Pronotum slightly foveate on each side behind, close to margin. Fovea of thoracic epipleura large, rather deep, oval, extending a little beyond middle. Prosternal carinae a little divergent behind, close together and parallel in front, where they extend a little beyond the middle of

prosternum. Mesosternum strongly, angularly notched in middle of anterior margin. Lateral margin of elytra somewhat explanate, especially on posterior half, but elytra without any pronounced submarginal furrow. Marginal bead of elytra slightly wider and more distinct than in *Coelophora*. Epipleura of elytra as in *Coelophora* except that the subhorizontal apical portion reaches quite to apex of elytron (in *Coelophora* beveled off a short distance before the apex). The minute punctures of pronotum a little closer and more distinct than those of the elytra. The larger, more or less pellucid punctures of elytra distributed about as in *Coelophora*. Characters of the male genitalia as given in preceding table.

Genotype: *Coelophora bissellata* Mulsant.

### OENOMIA MULSANT

By original account *Oenomia* contained six species, of which two were placed in *Pania*, two in *Axya*, and two in *Oenomia*, s. str. Crotch in his Revision (1874) gave *addicta* as the type, but *addicta* was one of the species included under *Pania*. This seems to be an invalid type fixation, and I consequently suggest that *O. cinctella* Muls., should be considered as the type. *O. cinctella* was the first species included under *Oenomia*, s. str.

### PSYLLOBOORA CHEVROLAT

*Thea* Mulsant should be included, as it shows no distinct departure from *Psyllobora*. The type of *Thea* has a somewhat different habitus from the American components, but in some of the other Old World species currently placed in *Thea*, the pattern of coloration is essentially the same as in American species.

Casey (1899) provided a table to separate the species of the United States, and the new species then erected have been unjustly merged in the Leng Catalogue as varieties of *P. 20-maculata* (Say). I here give a table of some of the North American species, mainly for the purpose of showing their relationship and specificity. This table is based on differences in the male genitalia.

### KEY TO NORTH AMERICAN SPECIES OF PSYLLOBOORA, BASED ON MALE GENITALIA

1. Sipho elongate, tapering from before the middle into a very long, tenuous portion..... 2  
Sipho short, not tenuous at apex, although sometimes tapering to a needle-like point... 3
2. Median lobe of tegmen depressed, about six times as long as wide, a little expanded asymmetrically just before the apex, the margins then converging to an acute, slightly upturned point; paramera slender, a little shorter than median lobe and almost perfectly straight; sipho somewhat longer than the body of insect, abruptly tenuous from the beginning of the second third..... *20-maculata* (Say)  
Median lobe of tegmen similar to preceding, but narrower, more aciculate, not expanded near the acute apex, which is not or just perceptibly upturned; paramera similar but more slender, slightly curved; sipho practically the same..... *taedata* Leconte
3. Sipho tapering to a needle-like point; median lobe of tegmen narrow and acicular..... 4  
Sipho compressed, becoming rather abruptly thinner and cylindrical near the beginning of the apical fifth and having a short membranous part at apex..... 6
4. Sipho very short, tapering rather abruptly in apical part to a fine acicular point..... 5  
Sipho somewhat longer, very gradually tapering from the middle to a very fine point; median lobe of tegmen some eight or nine times longer than wide, subdepressed, especially toward apex, which is acute and very slightly upturned; paramera elongate, almost as long as median lobe, slender, a little widened toward their bases and almost straight ..... *parvinotata* Casey
5. Median lobe of tegmen finely acicular, cylindrical, tapering at apex into an acute rather strongly upturned point; paramera very slender, straight and somewhat shorter than median lobe ..... *renifera* Casey

- Similar to preceding, but median lobe of tegmen less slender, compressed at base, slightly obtuse at apex, which is only slightly upturned; siphon a little longer. *juvenea* Timberlake
6. Paramera broad, more or less narrowed toward base, or rather slenderly clavate..... 7  
 Paramera moderately narrow, practically of the same width throughout, almost straight, and hardly more than three-fourths as long as median lobe of tegmen; latter about six times as long as wide, tapering nearly from the base to the acute apex, which is rather strongly curved upward..... *luctuosa* Mulsant
7. Paramera sublminate, not clavate..... 8  
 Paramera rather slender, nearly straight, except close to base and triangularly enlarged at apex; median lobe of tegmen about one-fourth longer than the paramera, with an elongate-oval, depressed, basal portion, tapering into a long slender upturned point, which is lamellately compressed..... *koebelei* Nunenmacher
8. Paramera narrowed about one-third toward base; median lobe of tegmen about one-fifth longer than the paramera and nearly of the same width, convex above, rather abruptly narrowed at beginning of apical fifth into a slender, strongly upturned point  
 borealis Casey  
 Paramera somewhat shorter than in *borealis*, broader at apex and narrowed about one-half toward base; median lobe of tegmen about one-fifth longer than the paramera, shaped as in *borealis*, except that it tapers gradually to the acute apex, with a just perceptible constriction near beginning of the last fifth, the apex strongly upturned and distinctly lamellately compressed..... *deficiens* Casey

### ILLEIS MULSANT

*Illeis cincta* of authors proves to be decidedly composite and I restrict the name to material from Ceylon, the type locality being "India orientalis." The segregates are extremely like *I. cincta* (Fabr.) and are not distinguishable with any certainty except by the male genitalia. Specimens of the *cincta* group have been seen from Los Baños, Luzon (Williams) and Java (Muir), but males are not available for study.

The following table, based mainly on the male genitalia, will serve to separate the known species of *Illeis*:

1. Elytra unicolorous testaceous, varying to creamy white and ferruginous..... 2  
 Elytra testaceous or yellow with sutural margins, transverse band at base, irregular band at middle, and apical mark, black; median lobe of tegmen moderately wide and convex above at base, ogivally narrowed at middle, with the apical half slender and slightly curved upward, the extreme apex being just perceptibly expanded and subtruncate; paramera ligulate, curved downward at apex, slightly longer than median lobe; siphon slender, cylindrical, slightly tapering but ending in a minute oval expansion (Australia)..... *galbula* (Mulsant)
2. Under parts of body entirely pale..... 3  
 Most of sternum, part of venter, coxae and femora, black; pronotum with two large black marks in the middle of the base, narrowly separated medially and reaching half-way to apical margin; median lobe of tegmen rather narrow, uniform in width to the rather abruptly upturned and truncate apex, as seen from above; in lateral view this lobe is considerably widened at base and thin at apex; paramera inserted close together, their bases somewhat lamellately expanded and vertical, their apical portion slender, slightly curved downward; siphon slender, cylindrical, tapering to a fine point at apex (1 ♂, Deli, Sumatra, De Bussy)..... *bistigmosa* (Mulsant)
3. Pronotum with two small basal black marks..... 4  
 Pronotum entirely pale ..... 8
4. Siphon not bifid at apex..... 5  
 Siphon subcylindrical, becoming a little slenderer and recurved in the apical sixth, the apex slightly thickened and rather deeply bifid; median lobe of tegmen rather stout, tubular, almost as broad as base of tegmen, tapering from the middle into a slender

upturned point, paramera slender, almost straight except at base and slightly clavate at apex (Lahore, India).....	<i>indica</i> n. sp.
5. Median lobe of tegmen moderately slender, more or less compressed at base and distinctly curved upward at apex, except in <i>cincta</i> .....	6
Median lobe of tegmen very slender, acicular, compressed at base, almost perfectly straight; paramera as in <i>indica</i> , except that they are much more curved; siphon slender, cylindrical, gradually tapering from the base, so that the apex becomes about one-half as thick as the base (Japan, Formosa, Szechwan).....	<i>koebelei</i> Timberlake
6. Median lobe of tegmen having the apex strongly curved upward and more or less depressed .....	7
Median lobe of tegmen nearly straight, strongly, laminately compressed, tapering into a very slender acute apex, the base a little deeper than broad; paramera slender, gently arched; siphon practically as in <i>confusa</i> (Ceylon).....	<i>cincta</i> (Fabricius)
7. Median lobe of tegmen subacicular as seen from above, tapering at apex into an acute upturned point, its base strongly compressed, thrice as deep as wide, its dorsal outline strongly bisinuate (gently arched in basal half and concave in apical half); paramera slender, much as in <i>indica</i> , but longer and gently arched; siphon as in <i>indica</i> except that it is not quite so slender and simple at apex (Hongkong)	<i>confusa</i> Timberlake
Median lobe of tegmen moderately stout, narrowed at beginning of apical sixth into an upturned point, compressed at base which is about twice as deep as wide, its dorsal outline arched in the basal third and gently concave beyond to apex; paramera shorter and stouter than in the preceding species, rather strongly curved near base, but otherwise straight; siphon much as in <i>confusa</i> , but longer (Chin-ling Mts., Shensi)	<i>shensiensis</i> n. sp.
8. Paramera stout, distinctly shorter than median lobe of tegmen; the latter broad, depressed, becoming narrower and subcompressed at base, about thrice as long as wide, the apex curved upward like the prow of a boat, with a short blunt projecting point; siphon about as in <i>confusa</i> (Amboina).....	<i>amboinensis</i> n. sp.
Paramera slender, perfectly straight and as long as median lobe of tegmen; the latter narrow, depressed, about four to five times as long as wide, and abruptly narrowed into an upturned point at apex; siphon nearly as in <i>amboinensis</i> (Luzon). <i>luzonica</i> n. sp.	

#### *Illeis indica* new species

Like *cincta*, but distinguishable by the male genitalia having the siphon bifid at apex, the median lobe of tegmen rather stout, convex above, about as deep at base as broad, and with a short slender upturned point at apex.

Described from 1 ♂, 4 ♀♀ (holotype male and paratypes), from Lahore, India. November 1910 (R. S. Woglum), in U. S. National Museum.

#### *Illeis shensiensis* new species

Like *cincta*, but larger and differing in the male genitalia as shown in above table. Length, 5 to 6 mm.

Described from 2 ♂♂, 1 ♀ (holotype male and paratypes), from Chin-ling Mountains, Shensi Province, China, April-May, 1904 (Elliott Blackwelder), in U. S. National Museum.

#### *Illeis amboinensis* new species

Like *cincta* except that it lacks the two basal black marks on the pronotum. Male genitalia as given in table. The paramera are comparatively short, straight, inserted close together, rather broad at base, sublaminate, tapering to the rather acute apex, and cirate on their inner margin beyond the middle and at the apex. Length, 4 mm., width, 3.5 mm.

Described from 1 ♂ (holotype), Amboina, February 1908 (F. Muir), in collection of the Hawaiian Sugar Planters' Experiment Station.



Fig. 1. *Macronacmia episcopalisa*  
 2. *Cissella furcifera*  
 3. *Mulsantina picta minor*  
 4. *Mulsantina picta minor*  
 5. *Mulsantina picta minor*  
 6. *Mulsantina mirifica*  
 7. *Mulsantina mirifica*  
 8. *Mulsantina mirifica*, var. *lynx*

Fig. 9. *Neomysia oblongoguttata*  
 10. *Paracanda viridescens*  
 11. *Egleis kingi*  
 12. *Egleis delta*  
 13. *Egleis edwardsii*  
 14. *Egleis barronensis*  
 15. *Verania flavoriittata*  
 16. *Protocaria scalaris*

## Plate II.

Fig. 17. *Artemis circumusta*

18. *Bothrocalvia pupillata*, var. *annectans*  
 19. *Phrynocaria gratiosa*, typical  
 20. *Phrynocaria gratiosa*, var. *flavoguttata*  
 21. *Phrynocaria gratiosa*, var. *palens*  
 22. *Phrynocaria gratiosa*, var. *nigrocincta*  
 23. *Phrynocaria gratiosa*, var. *nigrovittata*  
 24. *Phrynocaria gratiosa*, var. *koebelei*

Fig. 25. *Eocaria muiri*

26. *Gyrocaria guttata*  
 27. *Psyllobora koebelci*  
 28. *Psyllobora juvenca*  
 29. *Illeis galbula*  
 30. *Illeis koebelei*  
 31. *Coccinellina ecuadorica*  
 32. *Heterocaria papuana*

## NEW GENERA IN THIS PAPER

Coccinellina  
 Paraneda  
 Protocaria  
 Phrynocaria  
 Eocaria  
 Gyrocaria  
 Menochilus  
 Pseudadonia  
 Heterocaria  
 Spilocaria  
 Erythroneda  
 Chloroneda

NEW SPECIES, SUBSPECIES, AND VARIETIES  
IN THIS PAPER

*Neomysia oblongoguttata caseyi*  
*Cycloneda polita flava*  
*Paraneda viridescens*  
*Protocaria scalaris*  
*Coelophora inaequalis comperei*  
*Bothrocaltvia pupillata annectans*  
*Phrynocaria gratiosa flavoguttata*  
*Phrynocaria gratiosa palens*  
*Phrynocaria gratiosa nigrocincta*  
*Phrynocaria gratiosa koebeli*  
*Eocaria muiri*  
*Psyllobora juvenca*  
*Illeis amboinensis*  
*Illeis confusa*  
*Illeis indica*  
*Illeis koebeli*  
*Illeis luzonica*  
*Illeis shensiensis*  
*Coleomegilla maculata lengi*  
*Coleomegilla maculata tibialis*  
*Coleomegilla maculata boliviensis*  
*Coleomegilla maculata confluens*  
*Coleomegilla maculata maculata triangulifera*  
*Coccinellina ecuadorica*  
*Coccinellina shannoni*  
*Pseudadonia chiliana*  
*Heterocaria papuana*

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## Sugar Prices

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96° CENTRIFUGALS FOR THE PERIOD  
SEPTEMBER 16, 1942, TO DECEMBER 15, 1942

Date	Per pound	Per ton	Remarks
Sept. 16 - Dec. 15, 1942 . . . . .	3.74¢	\$74.80	Philippines



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